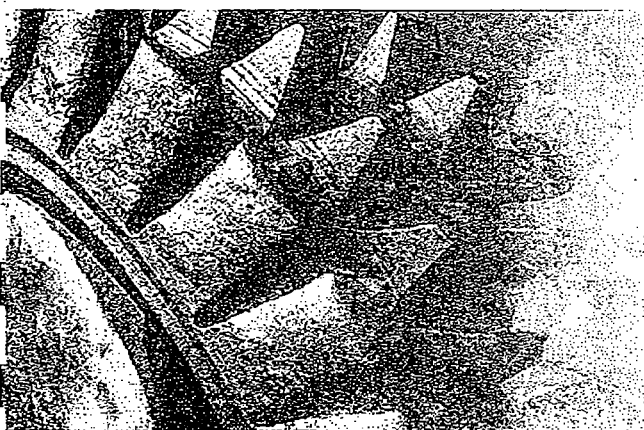
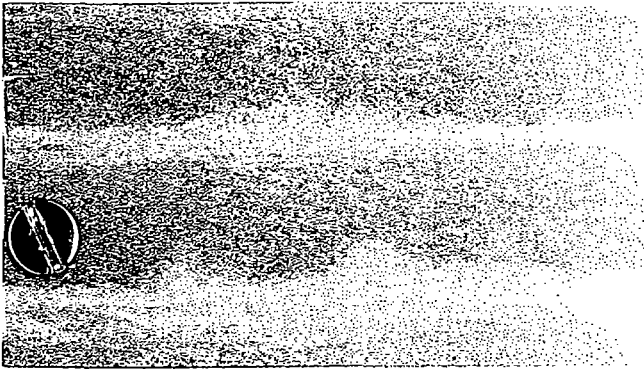


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**Volume I**  
**Remedial Action Report, Parcel 3 (Area A)**  
**Terminal 1 South**  
**Portland, Oregon**

**Prepared for**  
**Port of Portland**  
**Project/Task No. 24232/831**

**February 7, 2003**  
**15230-05**

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**Remedial Action Report  
Terminal 1 South, Parcel 3 (Area A)  
Portland, Oregon**

Anchorage

Boston

**Prepared for  
Port of Portland  
Project/Task No. 24232/831**

Denver

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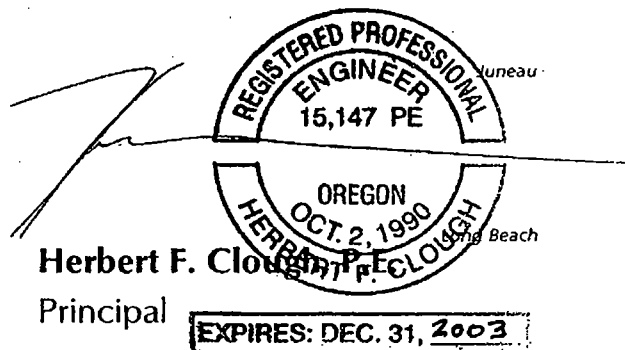
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**REMEDIAL ACTION REPORT  
PORT OF PORTLAND, TERMINAL 1 SOUTH, PARCEL 3 (AREA A)  
PORTLAND, OREGON**

**EXECUTIVE SUMMARY**

From December 2, 2002, to January 28, 2003, a Remedial Action (RA) was completed at the Port of Portland (Port) Terminal 1 South Site (T1S Site) in Portland, Oregon (Figure 1). This report serves as documentation of activities completed for closure of Parcel 3 (Area A) of the site. Closure activities were completed in accordance with our Removal Action Work Plan for the T1S Parcel 3 (Area A) Site (with responses to Oregon Department of Environmental Quality [DEQ] comments), the Removal Action Work Plan Addendum (applicable to Section 3.0 - Objectives and Rationale), the Record of Decision (ROD) and ROD amendment, and the Technical Specifications and Drawings.

The objectives of the RA were to reduce threats to human health from soil contaminated with polynuclear aromatic hydrocarbons (PAHs), lead, and arsenic, and to remove and dispose of soil with total petroleum hydrocarbons (TPH) to reduce risk to support future site use.

Previous environmental investigations conducted at the site identified T1S Site soil and groundwater concentrations exceeding screening levels. Likely or potential sources of contamination included underground storage tanks and dry wells. Petroleum hydrocarbons were identified as contaminants of interest. The human health risk assessment (HHRA) identified unacceptable risks to human receptors. The baseline risk assessment identified unacceptable risks to the residential, commercial worker, and construction/excavation worker receptors. The feasibility study determined that excavation of the soil exceeding established cleanup levels and that off-site disposal of the excavated soil were the best alternatives for the remedial action.

A total of 27,343 tons of soil were excavated and transported to the Hillsboro Landfill (licensed Subtitle D solid waste disposal facility) in Hillsboro, Oregon. The excavated soil was subsequently used as daily cover at the landfill facility or stockpiled for potential use as a protective layer over the environmental liner. After completing the removal, confirmation soil sampling was conducted in each excavation area (from the excavation bottom and sidewalls) to verify cleanup levels had been attained and to document the contaminant concentrations in remaining soil.

Approximately 7,000 cubic yards of clean fill imported from a Port Rivergate borrow site and clean on-site overburden material were used to backfill perimeter excavation side slopes (excavation areas 3, 4, 6, 7, 9, and 12) and adjacent to shoring installed along Front Avenue. Site security, provided by a chain-link fence running parallel to Front Avenue, prevents access to the T1S site.

Upon completion of remedial action activities, we estimated the magnitude of the residual risk remaining on site by removing the data corresponding to samples excavated during the cleanup, adding the confirmation sample results, and recalculating the predicted residual risk for the receptors with unacceptable risk in the baseline risk assessment. The baseline risk assessment identified unacceptable risks in Parcel 3 (Area A) under the residential, commercial worker, and construction/excavation worker scenarios. The calculated residual risk was acceptable for all pathways and receptors, except urban resident and commercial exposure to arsenic. However, the concentration of arsenic was below the site-specific background concentration in all samples but one. The one sample above the background concentration is located beneath Front Avenue where residential and commercial exposures to surface soil are not possible.

Based on these results, the risk to human health and the environment for Parcel 3 (Area A) of T1S is acceptable. Upon recording of the deed restrictions required by the ROD and ROD amendment, we recommend no further action at this portion of the site.

## **1.0 INTRODUCTION**

### **1.1 Purpose**

This report documents the Remedial Action (RA) performed at the Terminal 1 South (T1S) Parcel 3 (Area A) Site in Portland, Oregon (Figure 1). The purpose of the RA was to reduce threats to human health from soil contaminated with polynuclear aromatic hydrocarbons (PAHs), lead, arsenic, and total petroleum hydrocarbons (TPH). This report was prepared for the Port of Portland (Port) under Project/Task No. 24232/831.

### **1.2 Scope**

The scope of work was completed in accordance with the Removal Action Work Plan for the T1S Parcel 3 (Area A) Site (Hart Crowser, 2002d), responses to Oregon Department of Environmental Quality (DEQ) comments on the Work Plan (Hart Crowser, 2002e), the Removal Action Work Plan Addendum (Hart Crowser, 2002f), the ROD (DEQ, 2002a), ROD amendment (DEQ, 2002b), and

the Technical Specifications and Drawings (Port of Portland, 2002). These activities consisted of the following tasks:

- Installing temporary shoring to provide stability to adjacent Front Avenue during excavation activities;
- Excavating contaminated soil exceeding the cleanup levels or contaminated soil targeted to reduce risk to support future site use;
- Disposing of the contaminated soil in a licensed Subtitle D solid waste disposal facility;
- Performing confirmation sampling to verify cleanup levels had been attained and to document contaminant concentrations remaining in soil;
- Importing sand material from the Port Rivergate borrow site;
- Backfilling the excavation areas with the sand borrow material and suitable on-site material to provide stable and secure excavation slopes; and
- Preparing a report discussing the remedial action.

### **1.3 Report Organization**

This report presents a description and history of the site in Section 2 and summarizes previous work completed at the site in Section 3. The RA objectives and rationale are presented in Section 4, followed by discussions of the RA in Sections 5 and 6. Section 7 summarizes the residual risk assessment. Section 8 presents conclusions regarding the site cleanup. Supporting information is provided in tables, figures, and appendices.

### **1.4 Limitations**

Hart Crowser performed this work in accordance with generally accepted professional practices related to the nature of the work accomplished, in the same or similar localities, at the time the services were performed. This report is for the specific application to the referenced project and for the exclusive use of the Port. No other warranty, express or implied, is made.

## **2.0 SITE DESCRIPTION AND BACKGROUND**

### **2.1 Site Location and Description**

**Site Location.** The subject property for this RA report is Parcel 3 (Area A) of the T1S Site. The T1S Site is located at 2100 NW Front Avenue along the

Willamette River in Portland, Oregon (Figure 1). The site is located northwest of Interstate 405 (Fremont Bridge), northeast of NW Front Avenue, southeast of Slip No. 2, and southwest of the Willamette River (Figure 1 and Drawing C-3). Parcel 3 (Area A) covers an area of approximately 5 acres. The T1S Site does not include sediments adjacent to the site.

**Site Description.** Currently, the site is unoccupied. The topography at the T1S Site is generally level at an elevation of approximately 30 feet above mean sea level (msl). The site is generally paved with asphalt or concrete, with no vegetation or little bare ground present.

## **2.2 Site History**

Historically, Terminal 1 has been used for the staging of lumber, logs, paper products, steel containers, and bagged grain. Various companies have owned or leased portions of the T1S Complex (see RI Report; Hahn and Associates, 2001a).

## **2.3 Geology and Hydrogeology**

The subsurface soils encountered during previous investigations were predominantly sands and silts with occasional gravel to the maximum depth of investigation at 80 feet below the ground surface (bgs). Groundwater in the vicinity of the T1S Site generally occurs in three principal hydrogeologic zones: (1) a shallow unconfined fill/alluvial deposit (shallow water-bearing zone [WBZ]); (2) generally confined Troutdale WBZ; and (3) the confined Columbia River Basalt WBZ. Unconfined groundwater was encountered within the shallow WBZ (fill) at an average depth of approximately 23 feet bgs. Groundwater elevation measured in the seven monitoring wells installed at the T1S Site indicate a general flow to the northeast towards the Willamette River with a decline or even reversal of the gradient near the river (Hahn and Associates, 2001b).

## **3.0 SITE INVESTIGATIONS AND PREVIOUS WORK**

### **3.1 Remedial Investigation**

**Site Investigations.** Sampling events were conducted in 1998, 2000, and 2001. A total of 112 push-probe borings were installed for the collection of soil and groundwater samples during these site investigations. Please refer to the RI Report (Hahn and Associates, 2001a) for further discussion of these activities and results.

A groundwater investigation was conducted at the T1S Site in August, September, and October 2001 (Hahn and Associates, 2001b). Site activities

included installation, development, and sampling of seven groundwater monitoring wells at the site. Please refer to the groundwater sampling report for further discussion of these activities and results (Hahn and Associates, 2001b).

Environmental investigations conducted at the site identified T1S Site soils and groundwater concentrations exceeding screening levels. Likely or potential sources of contamination included underground storage tanks and dry wells. Petroleum hydrocarbons and metals were identified as contaminants of interest.

**Land Use.** The approximate 21-acre T1S Site has historically been zoned as "IH" for Heavy Industrial. Surrounding adjacent properties are zoned "IH" Heavy Industrial and "EX" Central Employment. The site is currently zoned as Central Residential (RX), such that it can be redeveloped for an alternative use. The RX zoning is considered the comprehensive plan for the property. Based on the RX zoning designation, it is expected the site will be used for mixed-use residential/commercial development in the future.

**Groundwater Use.** A beneficial groundwater use evaluation was conducted for the Hoyt Street Property (RETEC, 1997) that adjoins the southeast corner of the T1S Site. Hahn and Associates conducted an additional well inventory as part of the RI and the groundwater monitoring study to supplement the RETEC survey. Based on trends in groundwater use in the area, as well as RETEC fate and transport modeling, the only identified beneficial use for groundwater is discharge to the Willamette River. No water wells were found to be in use within 1/2 half mile of the T1S Site. No surface water rights were identified within 1/2 mile of the T1S Site.

### **3.2 Human Health and Ecological Risk Assessment**

**Human Health Risk Assessment.** Hart Crowser conducted a human health risk assessment (HHRA) for the T1S Site (Hart Crowser 2002a). Potentially exposed populations evaluated in the HHRA included future residents, current and future commercial workers, future utility/excavation workers, future construction workers, and recreational fishers. To assess human health from ingestion of fish tissue, we screened groundwater data against surface water criteria developed for this pathway. In summary, for Parcel 3 (Area A), the risk assessment identified unacceptable risk to human receptors as follows:

- Future resident or commercial worker dermal contact or ingestion of soil with PAHs, lead, and arsenic;
- Excavation worker dermal contact or ingestion of soil with lead; and
- Construction worker dermal contact or ingestion of soil with lead.

**Ecological Risk Assessment Results.** The Level 1 Scoping Ecological Risk Assessment (ERA) did not identify any ecologically important species or habitats at the T1S Site. The site has been almost entirely paved or covered by buildings (site improvements have since been demolished in preparation for redevelopment of the site for urban residential and commercial use). The absence of upland habitat indicates there are no complete exposure pathways for terrestrial ecological receptors to come in contact with contaminated soil at the T1S Site.

A Modified Level 2 Screening ERA was conducted on the available groundwater monitoring well data collected at this site (two monitoring events conducted September/October 2001 and January 2002). There were no detected concentrations of organic constituents in the seven groundwater monitoring wells that exceeded their corresponding Ecological Screening Benchmark Values (SBVs). There were two metals (copper and lead) detected in groundwater that exceeded SBVs based on the analysis of unfiltered, total metals, but, when the same samples were analyzed for dissolved metals, copper and lead were not detected. The dissolved fraction of metals represents the bioavailable fraction in aqueous environmental media. Therefore, it was concluded there is no potential for adverse ecological impacts to aquatic ecological receptors from the discharge of groundwater to the Willamette River. No additional ecological risk assessment activities are warranted at this site.

### **3.3 Feasibility Study**

**Feasibility Study.** A feasibility study was completed for the T1S Site (Hart Crowser, 2002b), and it was determined that excavation of the soil exceeding established cleanup levels, and that the off-site treatment/disposal of the excavated soil was the best alternative for the remedial action. Remedial action levels were established based on the HHRA (corresponding to the residential RBC [ $1 \times 10^{-6}$  for individual carcinogens or hazard index of 1 for noncarcinogens]) and the statistical background concentration for arsenic (Hahn and Associates, 2001a). Hot spot levels were calculated based on 100 times (carcinogens) or 10 times (noncarcinogens) the established cleanup level.

Table 1 of the Work Plan (Hart Crowser, 2000d) lists the cleanup levels for the commercial, excavation, and construction scenario and the hot spot level. Table 1 of the Removal Action Work Plan Addendum (Hart Crowser, 2002f) lists the urban residential cleanup levels. Figure 3 of the Work Plan (Hart Crowser, 2002d) identifies the areas exceeding the cleanup and hot spot levels.

### **3.4 Removal Action Work Plan**

In June 2002, a Removal Action Work Plan (Hart Crowser, 2002d) was submitted to the DEQ for review. DEQ's comments to the Work Plan (primarily associated with the confirmation sampling program) were addressed in a response letter submitted to the DEQ on July 25, 2002 (Hart Crowser, 2002e). The response letter was approved on July 26, 2002. Revised urban residential cleanup levels were provided in Table 1 of the Removal Action Work Plan Addendum (Hart Crowser, 2002f). Based on the revised urban residential cleanup levels, the Record of Decision (ROD) [DEQ, 2002a] was amended to more accurately reflect potential risks to future site urban residents. The Amendment to the ROD (DEQ, 2002b) was completed on December 18, 2002.

The selected RA for the T1S site consisted of the removal of soil above cleanup levels protective of future site residents, construction workers, and trench workers. For Parcel 3, risk-based decisions required excavation up to 10 feet. Additional excavation to 15 feet was completed to address TPH for future site development. The selected RA also included a deed restriction to assure future land use remained consistent with the selected remedy.

## **4.0 OBJECTIVES AND RATIONALE**

The objectives for the T1S Parcel 3 (Area A) Site remedial action were as follows:

- Remove soil exceeding cleanup levels (as described below); and
- Remove contaminated soil to reduce risk to support future site use.

**Remedial Action Cleanup Objective.** The project cleanup levels for the Parcel 3 (Area A) portion of the RA are presented in Table 1. These cleanup levels were established based on the urban residential exposure scenario and a  $1 \times 10^{-6}$  excess cancer risk for individual carcinogens.

## **5.0 DESCRIPTION OF REMEDIAL ACTIVITIES**

From December 2, 2002, to January 28, 2003, RA activities were performed at the T1S Parcel 3 (Area A) Site. The RA included site preparation activities, test pit explorations, temporary shoring, excavating contaminated soil, confirmation soil sampling, backfilling, and compacting. Wilder Construction of Portland, Oregon, under direct contract to the Port, completed the RA activities. Hart Crowser, under contract to the Port, provided oversight during shoring

implementation and collected confirmation samples. The Port provided construction inspection services and verification surveying. Soil was disposed of at the Hillsboro Landfill, a licensed Subtitle D solid waste landfill, in Hillsboro, Oregon.

Appendix A presents representative photographs of T1S Parcel 3 (Area A) RA activities. A detailed description of Hart Crowser's field procedures is included in Appendix B.

## **5.1 Site Preparation Activities**

**Permits.** The Port submitted design drawings and specifications to the City of Portland's Office of Planning and Development Review for a grading permit and Greenway review. The submittal was approved and issued on September 19, 2002, under Case File Number: LU 02-135500 GW EF. Hart Crowser performed special inspections and geotechnical observations according to State and Building Code and City of Portland Administrative Rules for shoring, grading, fill placement, and compaction. Copies of applicable project permits are included in Appendix C.

**Site Health and Safety Plan.** Wilder Construction and Hart Crowser prepared site-specific Health and Safety Plans (HASP) for the RA activities. The HASP was prepared in general accordance with the Occupational Safety and Health Act (OSHA) and the Oregon Administrative Rules (OAR). Hart Crowser's copy of the HASP is included in the Work Plan, dated June 13, 2002.

**Utility Locate.** The contractor contacted the Oregon Utility Notification Center, who in turn notified various utilities in the area to mark any underground installations in the vicinity of the site. An underground utility locate was conducted by Port personnel prior to performing any excavation activities.

**Waste Profiling.** Previous site investigation analytical data were submitted to Waste Management for acceptance as a non-hazardous waste. The concentration of total lead at sample locations B-38 (Point "T" in excavation area 8, 10 feet bgs) and B-68 (Point "Z" in excavation area 5, 2.5 feet bgs) was sufficient to warrant further testing for leachable lead (i.e., Toxic Characteristic Leaching Procedures [TCLP] test for lead). Composite samples were collected from separate stockpiles generated from point "T" and "Z" and submitted for TCLP analysis (RCRA 8 metals). Analytical results for the TCLP analysis showed low level detections of barium and lead (below hazardous waste criteria). Therefore, the soil generated from Point "T" and "Z" locations were considered a non-hazardous solid waste. Section 6.2.4 and Table 2 summarize the results of

the waste designation TCLP samples. A copy of the soil profile is included in Appendix D.

**Erosion Control.** Temporary erosion control measures implemented by the contractor included placement of biofilter bags around catch basins and managing stockpiles (i.e., covering with plastic). In addition, care was exercised to minimize soil spillage onto the sides of the trucks during the excavation/loading process. Any soil spilled on the truck sides was brushed off and returned to the removal area.

## **5.2 Test Pit Explorations**

Test pit explorations were completed for the purpose of defining the lateral extent of the perimeter of the excavation (excavation areas 1, 2, 3, 4, 6, 7, 10, and 12) and for collecting some confirmation samples prior to excavation. Terra Hydr of Portland, Oregon, completed the test pits with a trackhoe under subcontract to Hart Crowser. A Hart Crowser representative was present to observe and document the test pit exploration activities. We maintained detailed field logs for each test pit. Test pit boring logs are provided in Appendix B.

Thirty-one test pits explorations (TP-1 through TP-30 and TP-33) were completed at the locations shown on Drawing C-6. Proposed test pit exploration TP-31 and TP-32 were not completed due to access and utility restrictions. The test pit explorations were completed to a depth of 9 feet bgs and were sampled at three depth intervals (2 to 3, 5, and 9 feet bgs). Selected soil samples were submitted for TPH-Dx and PAH analysis. Based on comparison of laboratory analytical results to established cleanup levels, the perimeter excavation area boundaries were adjusted. The bid document design drawings (Drawings C-5 and C-6) were amended to reflect the excavation reduction in excavation areas 3, 4, 7, and 12. Excavation area 10 was removed from the scope of work. Test pit exploration sampling results (Tables 3 and 4) are discussed in Section 6.2.1.

**Abandonment.** Upon completion of the test pit explorations, the exploration was backfilled in reverse order (last out, first in) with the excavated soil. Soil was compacted using the trackhoe bucket.

## **5.3 Shoring**

Temporary shoring and bracing were constructed to provide stability to Front Avenue during excavation procedures completed at excavation areas 3, 5, 8, and 9. The shoring was installed using a low-overhead crane and in general accordance with design drawings (except that the full depth of shoring/bracing

was not achieved for piles #22, 23, 24, 25, and 48 due to underground obstructions). Hart Crowser personnel and the Port Inspector completed daily inspections of the shoring/bracing (i.e., deflection of shoring piles, integrity of adjacent Front Avenue sidewalk/street, etc.). Structural and shoring details are presented on Drawing S-1 and in Photographs 1 and 2.

#### **5.4 Well Abandonment and Demolition Activities**

**Well Abandonment.** On December 3, 2002, GeoTech Explorations of Tualatin, Oregon, abandoned monitoring well MW-1 (Start Card # 154404) in accordance with the Oregon Water Resource Department (OWRD) requirements (Photograph 3). Well abandonment documentation is provided in Appendix B.

**Demolition.** Demolition activities were completed to facilitate the excavation required to achieve cleanup levels. Various concrete structures (i.e., building footings, pilings, etc.) were encountered during excavation procedures. The concrete structures were predominantly encountered in excavation area 9 (Photograph 4). The concrete structures were removed and disposed of as clean fill at a permitted facility.

#### **5.5 Soil Excavation and Disposal**

The following presents a discussion of the excavation and disposal activities.

##### **5.5.1 Excavation Methodology**

The contractor's surveyor located the extent of each excavation area prior to construction activities. A majority of the excavation areas were paved with asphalt or concrete, with no vegetation or little bare ground present. The asphalt and concrete surfacing the site were removed prior to soil excavation. The asphalt was recycled of at a permitted facility. The concrete was disposed of as clean fill at a permitted facility.

Excavations were performed using a trackhoe. Loading of trucks occurred immediately adjacent to the side of the excavation using the trackhoe. Care was exercised to minimize soil spillage onto the sides of the trucks. Any soil spilled on the truck sides was brushed off and returned to the removal area. The trucks were covered with a tarp prior to leaving the site. Excavation depths were surveyed by Port surveyors to verify design depths were achieved.

The final extent of excavation areas 1 through 12 is shown on Drawing C-6. The summary table presented on Drawing C-6 shows the areas/depths/volumes of

each respective area that exceeded the cleanup level. Excavation details are shown on Drawing C-7.

### **5.5.2 Overburden Excavation/Stockpiling**

Overburden (0 to 5 feet bgs) from excavation areas 4 and 12 was excavated and temporarily stockpiled on site in a location designated by the Port for confirmation sampling. The clean overburden stockpile (approximately 1,200 cubic yards) was managed to prevent erosion and sediment runoff. Based on the confirmation sampling results (i.e., total TPH-Dx concentrations exceeding the established cleanup level of 750 mg/kg), a portion of the stockpile soil (approximately 400 cubic yards, Photograph 5) was deemed unsuitable for use as on-site fill. Therefore, the stockpiled soil was loaded and transported to Hillsboro Landfill in Hillsboro, Oregon, for disposal. Stockpile sample results are presented in Section 6.2.3.

### **5.5.3 Contaminated Soil Excavation**

Contaminated soil from excavation areas 1 through 12 was excavated and removed to the extent and elevations shown on the design drawings. Photographs 6 and 7 show typical removal in excavation areas 1 through 12. Section 6.2.2 presents confirmation sampling results for excavation areas 1 through 12.

### **5.5.4 Point "T" and "Z" Excavation**

**Point "T" and "Z."** Due to the potential for being classified as a hazardous waste, 10-foot radii about point "T" (depth 0 to 3 feet bgs, 35 cubic yards) and point "Z" (depth 5 to 10 feet bgs, 60 cubic yards) were excavated and stockpiled separately. Both stockpiles were managed to prevent erosion and sediment runoff. Based on the TCLP sampling results, both stockpiles were classified as a non-hazardous solid waste. Therefore, the stockpiled soil was loaded and transported to Hillsboro Landfill in Hillsboro, Oregon, for disposal. Point "T" and "Z" are indicated on Figure C-6. Point "T" and "Z" sample results are presented in Section 6.2.4.

### **5.5.5 Soil Disposal**

A total of 27,343 tons of contaminated soil (area excavations, stockpiled soil from Point T, stockpiled soil from point Z, and unsuitable overburden soil) were transported to the Hillsboro Landfill in Hillsboro, Oregon, for disposal. Based on personal communication with Hillsboro Landfill personnel, the contaminated soil was used as daily cover or was stockpiled for potential use as cover over a landfill environmental liner (i.e., beneficial use). Appendix D includes copies of

the disposal tickets, a summary table of the loads, and a certificate of disposal form from the landfill. Summaries of design removal volumes by area are provided in the tables on Drawing C-6.

## **5.6 Backfilling and Compacting**

**Geotextile.** Prior to backfilling, a nonwoven geotextile fabric was placed on the bottom and sidewalls of each excavation area. The geotextile served as a demarcation layer between the existing soil and the backfill material (Photograph 8). The edges of the fabric were overlapped a minimum of 1 foot to provide continuity.

**Backfill.** Clean on-site overburden soil (0 to 5 feet bgs) generated from excavation areas 4 and 12 (approximately 800 cubic yards) and imported clean fill sand (approximately 6,200 cubic yards) from the Port of Portland Rivergate borrow site were used as backfill for excavation area perimeter side slopes and along the shoring installed adjacent to Front Avenue. The Rivergate borrow site is a clean fill stockpile of Columbia River sand.

Backfilling performed adjacent to the shoring along Front Avenue was completed by constructing a 5-foot-wide bench to previously existing grade. The accompanying side slope tapering away from the bench was sloped at 2H:1V. Perimeter excavation area side slopes (excavation areas 3, 4, 6, 7, 9, and 12) were backfilled at 2H:1V to existing grade. Interior side slopes were graded to achieve 2H:1V. Typical backfilling schematics in the vicinity of shoring and excavation perimeters are shown on Drawing C-7 and Photographs 9 and 10.

**Compaction.** Backfill was spread in 12- to 24-inch-thick lifts and compacted to a minimum 90 percent of the maximum density (ASTM D1557). The backfill material was compacted with a smooth drummed-vibratory compactor in accordance with the technical specifications. Backfill material placed on 2:1 side slopes was compacted by tamping with the trackhoe bucket. All material was moistened as necessary to provide the moisture content required to readily facilitate the specified compaction. Grading and compacting the backfill material are shown in Photographs 11 and 12.

Copies of the moisture-density testing and compaction results are provided in Appendix C.

**Final Site Cleanup and Security.** The contractor removed from the site all debris and garbage generated by this work. After completion of all other work, the contractor removed any temporary facilities. Site security is provided by a chain-

link fence that runs parallel to Front Avenue. The fence prevents access to the T1S site.

## **6.0 CONFIRMATION SOIL SAMPLING**

Hart Crowser collected confirmation soil samples in accordance with the RA Work Plan (Hart Crowser, 2002d) and in response to DEQ comments. A detailed description of field procedures, including sample collection methods, is included in Appendix B.

### **6.1 Analyses Requested**

Soil samples were submitted to North Creek Analytical (NCA) of Beaverton, Oregon, for chemical analyses. All samples were collected in laboratory-supplied sample containers, marked with identifying information, and maintained under chain of custody protocols. The overall analytical testing program included the following analyses on selected samples:

- Diesel and heavy oil range hydrocarbons using NWTPH-Dx (all samples);
- PAHs using EPA Method 8270-SIM (selected samples); and
- Toxicity Characteristic Leaching Procedure (TCLP) metals (RCRA 8) using EPA Method 1311/6010A series methods (waste designation samples T-1 and Z-1).

Appendix E contains a quality assurance/quality control (QA/QC) review and complete laboratory analytical reports. Analytical laboratory results are summarized in Tables 2 through 5.

### **6.2 Analytical Results**

Confirmation soil samples were collected from the excavation floor and sidewalls in accordance with the work plan (Hart Crowser, 2002d). Discrete samples were collected, representing ranges of 0-3 feet bgs and below 3 feet. Drawing C-6 shows the sample locations. Sample locations were measured relative to site features. Waste designation TCLP samples are presented in Table 2. Analytical results for TPH-Dx from soil samples collected from excavation areas 1 through 12, overburden stockpiles, point "T," and point "Z" are summarized in Table 3. Analytical results for PAHs from soil samples collected from excavation areas 1 through 12 and overburden stockpiles are summarized in Tables 4 and 5, respectively.

### **6.2.1 Test Pit Explorations**

**TPH-Dx.** Test pit exploration samples were collected from excavation areas 1, 2, 3, 4, 6, 7, 10, and 12. TPH-Dx was not detected in samples collected from excavation areas 1, 6, 7, 10, and 12. TPH-Dx as heavy oil was detected in excavation area 2 (TP-25 [2-3]) and excavation area 3 (TP-30 [2-3]) at concentrations of 230 and 453 mg/kg, respectively. Two test pit samples collected in excavation area 4 (TP-17 [9] and TP-19 [9]) had detected total TPH-Dx concentrations of 253.6 and 319 mg/kg, respectively. All test pit exploration samples were less than the establish cleanup level of 750 mg/kg.

**PAHs.** PAHs were detected in one test pit exploration. Detected concentrations were below the urban residential cleanup levels.

### **6.2.2 Confirmation Sampling Results Excavation Areas 1 - 12**

**TPH-Dx.** Confirmation soil samples were collected from all areas excavated. TPH-Dx was not detected in excavation areas 1, 2, 4, and 12. All samples collected from within 3 feet of the ground surface did not exceed the established total TPH-Dx urban residential cleanup level of 750 mg/kg.

**PAHs.** Samples for PAH analysis were collected from excavation areas 4, 5, 6, 7, 8, and 12. PAHs were detected in seven of 12 samples collected. PAHs did not exceed any of the cleanup levels.

### **6.2.3 Stockpile Sampling Results**

As described in section 5.5.2, 5 feet of overburden was excavated and stockpiled from excavation areas 4 and 12. One composite sample was collected from each 200 cubic yards (or portion thereof) of soil within the stockpile. A total of eight composite soil samples (Stockpile 1 through Stockpile 8) were collected for TPH-Dx and PAHs for waste designation purposes.

TPH-Dx as diesel and heavy oil was detected in seven of eight stockpile samples, ranging in concentration from 395 to 1,066 mg/kg. Total TPH-Dx for stockpile samples Stockpile 5 (1,066 mg/kg) and Stockpile 6 (1,059 mg/kg) exceeded the established cleanup level of 750 mg/kg. PAHs were not detected above the established cleanup levels. Based on the sample results, the portion of the stockpiled material corresponding to composite samples Stockpile 5 and Stockpile 6 was loaded and transported to Hillsboro Landfill in Hillsboro, Oregon, for disposal.

#### **6.2.4 Point "T" and "Z" Sampling Results**

A composite sample was collected from each stockpile generated from the excavation at Point "T" and "Z." Both samples (T-1 and Z-1) were submitted for TPH-Dx and TCLP analysis (RCRA 8 metals). Total TPH-Dx concentrations for the waste designation samples were 826 mg/kg (T-1) and 523 mg/kg (Z-1). Analytical results for the TCLP analysis showed a low level detection of barium for both samples. Lead was detected in sample Z-1 at concentration of 0.976 mg/L. Barium and lead concentrations did not exceed hazardous waste criteria.

### **7.0 RESIDUAL RISK ASSESSMENT**

A residual human health risk assessment (HHRA) was conducted to evaluate the risks remaining in Parcel 3 (Area A) after the completion of the remedial action. This residual risk assessment was conducted in accordance with the requirements of OAR 340-122-084(4). The baseline HHRA identified unacceptable risks in Parcel 3 (Area A) under the residential, commercial worker, and construction/excavation worker scenarios (Hart Crowser, 2002). The unacceptable risk to construction/excavation workers was based on a single sample with elevated lead concentrations (Sample B-68 with 6,190 mg/kg lead, which has been removed). There were no predicted unacceptable risks to surface water receptors (ecological or human) or terrestrial ecological receptors.

Upon completion of Parcel 3 (Area A) remedial action activities, the total site risk was reduced with the removal of contaminated soil. For Parcel 3 (Area A), we estimated the magnitude of the residual risk remaining on site after remediation by removing the data corresponding to samples excavated during the cleanup, adding the confirmation sample results, and recalculating the predicted residual risk for the receptors with unacceptable risk in the baseline risk assessment. The receptors evaluated in this residual risk assessment were future urban residents, commercial workers, utility/excavation workers, and construction workers. The urban residential and commercial worker exposure scenarios evaluated exposure to surface soil (0 to 3 feet bgs), while the utility/excavation worker and construction worker exposure scenarios evaluated exposure to total soil (0 to 15 feet bgs).

The exposure parameters for the "urban residential" scenario were provided by DEQ and are presented in Tables F-3 through F-5 in Appendix F of this report. In addition, Appendix F presents the surface soil and total soil data sets used for residual risk and hazard calculations and final risk summary tables for this residual human health risk assessment.

## **7.1 Identification of Compounds of Potential Concern**

In accordance with DEQ human health risk assessment guidance (DEQ 2000a), compounds of potential concern (COPCs) were identified following the steps presented in Section 2.3.2 of the guidance. As described in Sections 2.3.2(1) and (2) of the guidance, compounds detected in soil and groundwater were screened based on frequency of detection and background concentrations, respectively. As recommended in Section 2.3.2(1), all compounds detected at a frequency of less than five percent were not selected as COPCs. Arsenic concentrations detected in soil in Parcel 3 (Area A) were screened against the site-specific background level established during the Remedial Investigation at this site (Hahn and Associates, 2001). Other metals were screened against the Washington Department of Ecology 90th percentile values as representative of regional background levels (Ecology, 1994). Arsenic, cadmium, and lead were detected at concentrations exceeding these background levels and were, therefore, retained as potential COPCs. These three metals and all organic compounds detected in soil were then conservatively screened against EPA Region 9 Residential Soil Preliminary Remediation Goals (PRGs), and VOCs detected in groundwater were conservatively screened against DEQ's Risk-Based Decision Making (RBDM; DEQ 2000b) Groundwater Vapor Intrusion into Buildings risk-based concentrations (RBCs). The DEQ RBCs were used rather than EPA Region 9 Tap Water PRGs because the groundwater to indoor air exposure pathway is the most conservative, potentially complete groundwater exposure pathway at Parcel 3 (Area A).

Additional steps, described in Section 2.3.2, (3)(a) through (e) of the DEQ human health risk assessment guidance, were also performed to ensure potential cumulative effects from multiple compounds or from an individual compound detected in multiple media were accounted for (see Table F-1). The following COPCs were identified in Parcel 3 (Area A):

- Soil: Diesel, oil, benzo(a)pyrene, and arsenic. No soil PRGs are available for diesel and heavy oil; however, since both analytes were detected in soil, they were retained as COPCs.
- Groundwater: Diesel. Diesel was identified as a COPC because an RBC is not available. Heavy oil was not detected in groundwater.

## **7.2 Development of Exposure Point Concentrations**

Exposure point concentrations (EPCs) represent the chemical concentrations in the soil and groundwater that a receptor will potentially contact during the exposure period. The EPCs for the site's COPCs were derived from sampling

data. The urban residential and commercial worker scenarios were evaluated based on exposure to surface soil (0 to 3 feet bgs), while the excavation worker and construction worker scenarios were based on exposure to surface and subsurface soil or total soil (0 to 15 feet bgs). No VOCs were identified as soil COPCs; therefore, soil from 15 feet bgs down to groundwater was not considered in the volatilization to indoor and outdoor air pathways. EPCs for this residual HHRA are presented in Table F-2 and were calculated using the same methodology used in the baseline HHRA.

### **7.3 Exposure Factors**

To quantitate intake estimates for site-related chemicals, EPCs are combined with variables that describe the exposed population (e.g., contact rate, exposure frequency and duration, body weight). Exposure factors for this residual HHRA are presented in Tables F-3 through F-5 and are the same exposure factors used in the baseline HHRA, residual HHRA for Parcel 2 (Area B), and the urban resident HHRA for Parcel 2 (Area B).

### **7.4 Toxicity Assessment**

Toxicity criteria used in this residual HHRA are presented in Table F-6 and were identified using the same hierarchy of sources for toxicity criteria used in the baseline HHRA.

### **7.5 Risk Characterization**

**Urban Residents.** The residual risk assessment for future urban residents resulted in acceptable cumulative carcinogenic risks. The total RME residual cancer risk for the urban residential scenario was calculated to be  $4 \times 10^{-6}$ , which is less than the OAR 340-122 acceptable level of  $1 \times 10^{-5}$ . However, the RME risk estimate associated with arsenic ( $4 \times 10^{-6}$ ) exceeds the DEQ acceptable risk level of  $1 \times 10^{-6}$  for individual carcinogens. The CT risk estimate of  $2 \times 10^{-7}$  was acceptable. The unacceptable estimated risk was based on the maximum detected concentration present at sample location B-97 that was used to represent the RME EPC. All other detected concentrations of arsenic in surface soils were below the site-specific background concentration of 5.3 mg/kg (Hahn and Associates, 2001). Sample B-97 is located below NW Front Avenue (Hahn and Associates, 2001) in a location where residential development is not possible, hence residential exposure to surface soil is not possible. If this sample is excluded from the risk calculations, all estimated human health risks for the urban residential receptor are acceptable.

The cumulative and individual hazard indices (HIs) were acceptable. The total RME hazard index for residual non-cancer risks for the urban residential scenario was calculated to be  $9 \times 10^{-2}$ .

**Commercial Workers.** The residual risk assessment for future commercial workers resulted in acceptable cumulative carcinogenic risks. The total RME residual cancer risk for the commercial worker scenario was calculated to be  $4 \times 10^{-6}$ , which is less than the OAR 340-122 acceptable level of  $1 \times 10^{-5}$ . However, the risk associated with arsenic ( $4 \times 10^{-6}$ ) exceeds the DEQ acceptable risk level of  $1 \times 10^{-6}$  for individual carcinogens. As discussed above, the unacceptable estimated human health risk was based on the maximum detected concentration present at sample location B-97. This sample is located in the street where commercial exposure to surface soil is not possible. If this sample is excluded from the risk calculations, all estimated human health risks for the commercial receptor are acceptable.

The cumulative and individual HIs were acceptable. The total RME hazard index for residual non-cancer risks for the commercial worker scenario was calculated to be  $3 \times 10^{-2}$ .

**Utility/Excavation Workers.** The residual risk assessment for future utility/excavation workers resulted in acceptable cumulative and individual carcinogenic risks. The total RME residual cancer risk for the utility/excavation worker scenario was calculated to be  $5 \times 10^{-8}$  with no individual COPCs exceeding the individual carcinogen target risk level of  $1 \times 10^{-6}$ .

The cumulative and individual HIs were acceptable. The total RME hazard index for residual non-cancer risks for the utility/excavation worker scenario was calculated to be  $7 \times 10^{-3}$ .

**Construction Workers.** The residual risk assessment for future construction workers resulted in acceptable cumulative and individual carcinogenic risks. The total RME residual cancer risk for the construction worker scenario was calculated to be  $8 \times 10^{-7}$  with no individual COPCs exceeding the individual carcinogen target risk level of  $1 \times 10^{-6}$ .

The cumulative and individual HIs were acceptable. The total RME hazard index for residual non-cancer risks for the construction worker scenario was calculated to be  $1 \times 10^{-1}$ .

**Total Petroleum Hydrocarbons (TPH).** Diesel and heavy oil were identified as COPCs in Section 7.1. As discussed in the baseline HHRA, risks and hazards associated with TPH are evaluated using an indicator approach. The indicator

compounds quantitatively evaluated in this residual HHRA are benzene, toluene, xylenes, and ethylbenzene (BTEX) and polycyclic aromatic hydrocarbons (PAHs). BTEX compounds were not detected in soil or groundwater at Parcel 3 (Area A), and the risks associated with benzo(a)pyrene, the only PAH identified as a Parcel 3 COPC, are acceptable. Therefore, the risks and hazards associated with TPH at Parcel 3 are assumed to be acceptable for all receptors evaluated in this residual HHRA.

## 8.0 CONCLUSIONS

Based on previous site work and the remedial action described in this report, we conclude the following for Parcel 3 (Area A) at Terminal 1 South:

- The baseline risk assessment identified unacceptable risks to the residential, commercial worker, and construction/excavation worker receptors.
- The feasibility study identified excavation with off-site disposal as a suitable remedial action.
- The DEQ prepared a ROD and ROD amendment with cleanup levels based on an urban residential receptor and construction receptor. The ROD and ROD amendment were made available for public comment.
- 27,343 tons of soil with PAHs, TPH, and/or metals were excavated from the site and disposed of in an off-site landfill.
- Confirmation soil samples were collected from the excavation sidewalls and bottom. All results were below the cleanup levels.
- The calculated residual risk was acceptable for all pathways and receptors, except urban resident and commercial exposure to arsenic. However, the concentration of arsenic was below the site-specific background concentration in all samples but one. The one sample above the background concentration is located beneath Front Avenue, where residential and commercial exposures to surface soil are not possible.
- Because the risks to human health and the environment are acceptable, upon recording of the deed restrictions required by the ROD and ROD amendment, we recommend no further action for Parcel 3 (Area A) of T1S.

## 9.0 REFERENCES

- DEQ, 2002a. Record of Decision – Selected Remedial Action, Marine Terminal 1 South, Portland, Oregon. September 26, 2002.
- DEQ, 2002b. Record of Decision Amendment – Selected Remedial Action, Marine Terminal 1 South, Portland, Oregon. December 18, 2002.
- Hahn and Associates, 2001a. Terminal 1 South Remedial Investigation Report. July 12, 2001 (Volumes 1 and 2).
- Hahn and Associates, 2001b. Monitoring Well Installation and Groundwater Sampling Report. December 19, 2001.
- Hart Crowser, 2002a. Human Health and Ecological Baseline Risk Assessment, Terminal 1 South, Portland, Oregon. January 18, 2002.
- Hart Crowser, 2002b. Feasibility Study, Terminal 1 South, Portland, Oregon. February 1, 2002.
- Hart Crowser, 2002c. Human Health and Ecological Baseline Risk Assessment Addendum, Terminal 1 South, Portland, Oregon. June 12, 2002.
- Hart Crowser, 2002d. Removal Action Work Plan, Terminal 1 South, Portland, Oregon. June 13, 2002.
- Hart Crowser, 2002e. Response to Approval Comments on the Removal Action Work Plan, Terminal 1 South, Portland, Oregon. July 25, 2002.
- Hart Crowser, 2002f. Removal Action Work Plan Addendum (Section 3.0 – Objectives and Rationale), Terminal 1 South, Portland, Oregon. October 31, 2002.
- Port of Portland, 2002. Remedial Action Parcel 3 (Area A) Technical Specifications and Drawings, Terminal 1 South, Portland, Oregon. July 2002.
- RETEC, 1997. Groundwater Beneficial Use Assessment for the Hoyt Street Railyard and Surrounding Area, Portland, Oregon. March 27, 1997.

**Table 1 - Soil Cleanup Levels**  
**Terminal 1 South, Parcel 3 (Area A) Remedial Action Report**  
**Portland, Oregon**

COPC	Cleanup Levels in mg/kg	
	Urban Residential	Construction-EPA
Applicable Depth Interval (feet from ground surface)	0 - 3	0 - 15
Total TPH-Dx	750	NA
PAHs		
Benzo(a)anthracene	2.9	21
Benzo(a)pyrene	0.29	2.1
Benzo(b)fluoranthene	2.9	21
Dibenz(a,h)anthracene	0.29	2.1
Indeno(1,2,3-cd)pyrene	2.9	21

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**Notes:**

1. TPH-Dx = Total Petroleum Hydrocarbons as Diesel.
2. Cleanup Level for TPH-Dx is the Urban Resident Child Concentration developed by Hoyt Street Yards (see Hart Crowser 2002b).
3. Cleanup level for PAHs based on urban resident exposure scenario and a  $1 \times 10^{-6}$  excess cancer risk for individual carcinogens.
4. NA = Not Applicable. A TPH cleanup level for the construction worker scenario was not established.

**Table 2 - Analytical Results: Waste Designation (TCLP Metals)**  
**Terminal 1 South, Parcel 3 (Area A) Remedial Action Report**  
**Portland, Oregon**

Sample-ID	Z-1	T-1	
Sample Date	20-Dec-02	8-Jan-03	
Sample Depth (feet bgs)	Composite (0 to 3)	Composite (5 to 10)	Hazardous Waste Criteria (TCLP)
Sample Area	Area 5	Area 8	
<b>TCLP Metals in mg/L</b>			
Arsenic	< 0.1	< 0.1	5
Barium	1.9	0.258	100
Cadmium	< 0.1	< 0.1	1
Chromium	< 0.1	< 0.1	5
Lead	0.976	< 0.1	5
Mercury	< 0.0002	< 0.0002	0.2
Selenium	< 0.1	< 0.1	1
Silver	< 0.1	< 0.1	5

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**Notes:**

1. Shading represents detected concentration of listed analyte.
2. TCLP = Toxicity Characteristic Leaching Procedure.
3. Sample depth (feet bgs) = below ground surface.
4. mg/L = milligrams per Liter (ppm).

Table 3 - Analytical Results: Confirmation Soil Samples (TPH-Dx)  
Terminal 1 South, Parcel 3 (Area A) Remedial Action Report  
Portland, Oregon

Sample ID	Sample Date	Test Pit, Excavation Bottom, or Skidplate	Sample Depth (feet bgs)	NWTPH-Dx		Total TPH-Dx Concentration
				Diesel	Oil	
Area 1	TP-33 (2-3) A-1/S-1	10-Oct-02 05-Dec-02	Test Pit Bottom	2 to 3 3.2	< 25 < 25	< 50 < 50
Area 2	TP-25 (2-3)	10-Oct-02	Test Pit	2 to 3	< 25	< 50
	TP-27 (2-3)	10-Oct-02	Test Pit	2 to 3	< 25	< 50
	TP-28 (2-3)	10-Oct-02	Test Pit	2 to 3	< 25	< 50
	A-2/S-1	17-Dec-02	Bottom	5.2	< 25	< 50
Area 3	TP-29 (2-3)	10-Oct-02	Test Pit	2 to 3	< 25	< 50
	TP-30 (2-3)	10-Oct-02	Test Pit	2 to 3	< 25	< 50
	A-3/S-1	14-Jan-03	Bottom	5.2	< 25	< 50
	A-3/S-10 (Dux)	14-Jan-03	Bottom	5.2	< 25	< 50
Area 4	TP-16 (9)	9-Oct-02	Test Pit	9	< 25	< 50
	TP-17 (9)	9-Oct-02	Test Pit	9	< 25	< 50
	TP-18 (9)	10-Oct-02	Test Pit	9	< 25	< 50
	TP-22 (9)	10-Oct-02	Test Pit	9	< 25	< 50
	TP-23 (9)	10-Oct-02	Test Pit	9	< 25	< 50
	A-4/S-1	8-Jan-03	Bottom	15.2	< 25	< 50
	A-4/S-2	8-Jan-03	Bottom	15.2	< 25	< 50
	A-4/S-3	8-Jan-03	Bottom	15.2	< 25	< 50
	A-4/S-4	8-Jan-03	Bottom	15.2	< 25	< 50
	A-4/S-5	8-Jan-03	Bottom	15.2	< 25	< 50
Area 5	A-5/S-1	8-Jan-03	Sidesclope	10	< 25	< 50
	A-5/S-2	8-Jan-03	Bottom	15.2	< 25	< 50
	A-5/S-3	8-Jan-03	Bottom	15.2	< 25	< 50
	A-5/S-4	8-Jan-03	Bottom	15.2	< 25	< 50
	A-5/S-5	8-Jan-03	Bottom	15.2	< 25	< 50
	A-5/S-6	8-Jan-03	Bottom	15.2	< 25	< 50
	A-5/S-7	8-Jan-03	Bottom	15.2	< 25	< 50
	A-5/S-8	8-Jan-03	Bottom	15.2	< 25	< 50
	A-5/S-9	8-Jan-03	Bottom	15.2	< 25	< 50
	A-5/S-10	8-Jan-03	Bottom	15.2	< 25	< 50
	A-5/S-11	8-Jan-03	Sidesclope	10	< 25	< 50
A-5/S-110 (Dux)	8-Jan-03	Sidesclope	10	< 25	< 50	
Area 6	TP-15 (2-3)	9-Oct-02	Test Pit	2 to 3	< 25	< 50
	A-6/S-1	14-Jan-03	Bottom	4.2	< 25	< 50
	A-6/S-10 (Dux)	14-Jan-03	Bottom	4.2	< 25	< 50
	A-6/S-2	14-Jan-03	Bottom	4.2	< 25	< 50
Area 7	TP-6 (2-3)	9-Oct-02	Test Pit	2 to 3	< 25	< 50
	TP-4 (2-3)	9-Oct-02	Test Pit	2 to 3	< 25	< 50
	A-7/S-1	14-Jan-03	Bottom	3.2	< 25	< 50
	A-7/S-2	14-Jan-03	Bottom	3.2	< 25	< 50
	A-7/S-3	14-Jan-03	Bottom	3.2	< 25	< 50
	A-7/S-30 (Dux)	14-Jan-03	Bottom	3.2	< 25	< 50
A-7/S-4	14-Jan-03	Bottom	3.2	< 25	< 50	
Area 8	A-8/S-1	14-Jan-03	Bottom	5.2	< 25	< 50
	A-8/S-2	14-Jan-03	Sidesclope	7.5	< 25	< 50
	A-8/S-25 (Dux)	14-Jan-03	Sidesclope	7.5	< 25	< 50
	A-8/S-3	14-Jan-03	Bottom	5.2	< 25	< 50
	A-8/S-4	14-Jan-03	Bottom	10.2	< 25	< 50
	A-8/S-5	14-Jan-03	Sidesclope	7.5	< 25	< 50
Area 9	A-9/S-1	2-Jan-03	Sidesclope	7.5	< 25	< 50
	A-9/S-2	2-Jan-03	Bottom	10.2	< 25	< 50
	A-9/S-3	2-Jan-03	Bottom	10.2	< 125	< 50
	A-9/S-4	2-Jan-03	Sidesclope	6.5	< 25	< 50
	A-9/S-5	2-Jan-03	Bottom	10.2	< 25	< 50
	A-9/S-6	2-Jan-03	Bottom	10.2	< 125	< 50
Area 10	TP-1 (2-3)	9-Oct-02	Test Pit	2 to 3	< 25	< 50
	TP-3 (2-3)	9-Oct-02	Test Pit	2 to 3	< 25	< 50
Area 11	A-11/S-1	8-Jan-03	Sidesclope	9.5	< 25	< 50
	A-11/S-2	8-Jan-03	Bottom	15.2	< 25	< 50
	A-11/S-3	8-Jan-03	Sidesclope	9	< 25	< 50
Area 12	TP-4 (2-3)	9-Oct-02	Test Pit	2 to 3	< 25	< 50
	TP-8 (9)	9-Oct-02	Test Pit	9	< 25	< 50
	TP-9 (2-3)	9-Oct-02	Test Pit	2 to 3	< 25	< 50
	TP-9 (9)	9-Oct-02	Test Pit	9	< 25	< 50
	TP-13 (9)	9-Oct-02	Test Pit	9	< 25	< 50
	TP-11 (2-3)	9-Oct-02	Test Pit	2 to 3	< 25	< 50
	TP-11 (9)	9-Oct-02	Test Pit	9	< 25	< 50
	TP-12 (9)	9-Oct-02	Test Pit	9	< 25	< 50
	A-12/S-1	8-Jan-03	Bottom	15.2	< 25	< 50
	A-12/S-2	8-Jan-03	Bottom	15.2	< 25	< 50
A-12/S-3	8-Jan-03	Sidesclope	9	< 25	< 50	
Clean Skidplates	Skidplate 1	11-Dec-02	NA	Composite	< 25	< 50
	Skidplate 2	11-Dec-02	NA	Composite	< 25	< 50
	Skidplate 3	11-Dec-02	NA	Composite	< 25	< 50
	Skidplate 4	11-Dec-02	NA	Composite	< 25	< 50
	Skidplate 5	11-Dec-02	NA	Composite	< 25	< 50
	Skidplate 6	11-Dec-02	NA	Composite	< 25	< 50
	Skidplate 7	11-Dec-02	NA	Composite	< 25	< 50
	Skidplate 8	11-Dec-02	NA	Composite	< 25	< 50
Waste Designation	T-1	8-Jan-03	NA	Composite	< 25	< 50
	Z-1	29-Dec-02	NA	Composite	< 25	< 50

### Notes

1. Swirling represents detected concentration of listed analyte.
2. Sample depth (feet bgs) = below ground surface. Sample collected at bottom of elevation subtract 0.2 feet (sampling procedure requires retrieval of surface soil prior to sampling).
3. mpyg = milligrams per kilogram (ppm).
4. WPTPH-Dx = Northwest Total Petroleum Hydrocarbon Diesel Extended.
5. Dup = Duplicate Sample.
6. NA = Not applicable.
7. Bold = The portion of the stockpiled material generated from the clean overruns from Areas 4 and 12 (0 to 5 feet bgs) corresponding to the composite sample was loaded and transported to the site for disposal. *Crucial to the investigation.*

Table 4 - Analytical Results: Confirmation Soil Samples for Excavation Areas 1 through 12 (PAHs)  
Terminal 1 South, Parcel 3 (Area A) Remedial Action Report  
Portland, Oregon

Sample Number	TP-33 Area 1	A-4/S-3 4	A-5/S-1 5	A-5/S-5 5	A-6/S-1 6	A-6/S-2 6	TP-5 7	TP-6 7	A-7/S-1 7	Human Health Cleanup Levels		
Test Pit, Excavation Bottom, or Sideslope	Test Pit	Bottom	Sideslope	Bottom	Bottom	Bottom	Test Pit	Test Pit	Bottom	Urban Residential	Construction	
Sample Date	9-Oct-02	8-Jan-03	8-Jan-03	8-Jan-03	14-Jan-03	14-Jan-03	9-Oct-02	9-Oct-02	14-Jan-03			
Sample Depth (feet bgs)	2 to 3	15.2	10	15.2	4.2	4.2	2 to 3	2 to 3	3.2	0 - 3 feet	0 - 15 feet	
PAHs (EPA 8270 SIM)												
	Concentration in mg/kg (ppm)											
Acenaphthene	< 0.0134	< 0.0268	< 0.0134	< 0.0134	< 0.0134	< 0.0268	< 0.0134	< 0.0134	< 0.0268	--	--	
Acenaphthylene	< 0.0134	0.0277	< 0.0134	< 0.0134	< 0.0134	< 0.0268	< 0.0134	< 0.0134	< 0.0268	--	--	
Anthracene	< 0.0134	0.0422	< 0.0134	< 0.0134	< 0.0134	< 0.0268	< 0.0134	< 0.0134	0.0273	--	--	
Benzo(a)anthracene	0.0179	0.195	< 0.0134	0.0249	< 0.0134	0.0268	< 0.0134	< 0.0134	0.0617	2.9	21	
Benzo(a)pyrene	< 0.0134	0.162	< 0.0134	0.0205	< 0.0134	0.0268	< 0.0134	< 0.0134	0.0462	0.29	2.1	
Benzo(b)fluoranthene	< 0.0134	0.0692	< 0.0134	< 0.0134	< 0.0134	< 0.0268	< 0.0134	< 0.0134	0.0457	2.9	21	
Benzo(g,h,i)perylene	< 0.0134	0.0876	< 0.0134	< 0.0134	< 0.0134	< 0.0268	< 0.0134	< 0.0134	0.0347	--	--	
Benzo(k)fluoranthene	< 0.0134	0.114	< 0.0134	0.0948	< 0.0134	< 0.0268	< 0.0134	< 0.0134	0.0403	--	--	
Chrysene	0.0138	0.200	< 0.0134	0.0239	< 0.0134	0.0268	< 0.0134	< 0.0134	0.0667	--	--	
Dibenzo(a,h)anthracene	< 0.0134	0.0291	< 0.0134	< 0.0134	< 0.0134	< 0.0268	< 0.0134	< 0.0134	< 0.0268	0.29	2.1	
Fluoranthene	0.0198	0.225	< 0.0134	0.0272	< 0.0134	0.0268	< 0.0134	< 0.0134	0.0583	--	--	
Fluorene	< 0.0134	< 0.0268	< 0.0134	< 0.0134	< 0.0134	< 0.0268	< 0.0134	< 0.0134	< 0.0268	--	--	
Ideno(1,2,3-cd)pyrene	< 0.0134	0.0789	< 0.0134	< 0.0134	< 0.0134	< 0.0268	< 0.0134	< 0.0134	0.0203	2.9	21	
Naphthalene	< 0.0134	< 0.0268	< 0.0134	< 0.0134	< 0.0134	< 0.0268	< 0.0134	< 0.0134	< 0.0268	--	--	
Phenanthrene	< 0.0134	0.142	< 0.0134	< 0.0134	< 0.0134	0.0618	< 0.0134	< 0.0134	0.112	--	--	
Pyrene	0.0220	0.268	< 0.0134	0.0326	< 0.0134	0.0689	< 0.0134	< 0.0134	0.101	--	--	

Sample Number	A-7/S-2	A-7/S-3	A-7/S-4	A-8/S-1	A-8/S-3	TP-1	TP-3	A-12/S-2	Human Health Cleanup Levels	
Area	7	7	7	8	8	10	10	12	Urban Residential	Construction
Test Pit, Excavation Bottom, or Sideslope	Bottom	Bottom	Bottom	Bottom	Bottom	Test Pit	Test Pit	Bottom		
Sample Date	14-Jan-03	14-Jan-03	14-Jan-03	14-Jan-03	14-Jan-03	9-Oct-02	9-Oct-02	8-Jan-03	0 - 3 feet	0 - 15 feet
Sample Depth	3.2	3.2	3.2	5.2	5.2	2 to 3	2 to 3	15.2		
PAHs (EPA 8270 SIM)										
	Concentration in mg/kg (ppm)									
Acenaphthene	< 0.0134	< 0.0134	< 0.0134	< 0.067	< 0.067	< 0.0134	< 0.0134	< 0.0134	--	--
Acenaphthylene	< 0.0134	< 0.0134	< 0.0134	< 0.067	< 0.067	< 0.0134	< 0.0134	< 0.0134	--	--
Anthracene	< 0.0134	< 0.0134	< 0.0134	< 0.067	< 0.067	< 0.0134	< 0.0134	< 0.0134	--	--
Benzo(a)anthracene	< 0.0134	< 0.0134	< 0.0134	0.0865	< 0.067	< 0.0134	< 0.0134	< 0.0134	2.9	21
Benzo(a)pyrene	< 0.0134	< 0.0134	< 0.0134	0.0505	0.0768	< 0.0134	< 0.0134	< 0.0134	0.29	2.1
Benzo(b)fluoranthene	< 0.0134	< 0.0134	< 0.0134	< 0.067	0.0570	< 0.0134	< 0.0134	< 0.0134	2.9	21
Benzo(g,h,i)perylene	< 0.0134	< 0.0134	< 0.0134	0.0200	< 0.067	< 0.0134	< 0.0134	< 0.0134	--	--
Benzo(k)fluoranthene	< 0.0134	< 0.0134	< 0.0134	< 0.067	< 0.067	< 0.0134	< 0.0134	< 0.0134	--	--
Chrysene	< 0.0134	< 0.0134	< 0.0134	0.110	0.0825	< 0.0134	< 0.0134	< 0.0134	--	--
Dibenzo(a,h)anthracene	< 0.0134	< 0.0134	< 0.0134	< 0.067	< 0.067	< 0.0134	< 0.0134	< 0.0134	0.29	2.1
Fluoranthene	0.0154	< 0.0134	< 0.0134	0.0581	0.110	< 0.0134	< 0.0134	< 0.0134	--	--
Fluorene	< 0.0134	< 0.0134	< 0.0134	< 0.067	< 0.067	< 0.0134	< 0.0134	< 0.0134	--	--
Ideno(1,2,3-cd)pyrene	< 0.0134	< 0.0134	< 0.0134	< 0.067	< 0.067	< 0.0134	< 0.0134	< 0.0134	2.9	21
Naphthalene	< 0.0134	< 0.0134	< 0.0134	< 0.067	< 0.067	< 0.0134	< 0.0134	< 0.0134	--	--
Phenanthrene	< 0.0134	< 0.0134	< 0.0134	0.135	0.0888	< 0.0134	< 0.0134	< 0.0134	--	--
Pyrene	0.0184	< 0.0134	< 0.0134	0.129	0.142	< 0.0134	< 0.0134	< 0.0134	--	--

P:\Data\Lab\Port of Portland\10230 Term 1 Support\Parcel 3\Consolidation Report\Tables (Table 4)

Notes:

- Shading represents detected concentrations of listed analyte.
- Bold represents detected concentration above the cleanup level.
- Sample depth (feet bgs) = below ground surface. Sample collected at bottom of elevation subtract 0.2 feet (sampling procedure requires removal of surface soil prior to sampling).
- mg/kg = milligrams per kilogram (ppm).
- PAHs = Polynuclear Aromatic Hydrocarbons.

**Table 5 - Analytical Results: Confirmation Soil Samples for Clean Stockpiles (PAHs)**  
**Terminal 1 South, Parcel 3 (Area A) Remedial Action Report**  
**Portland, Oregon**

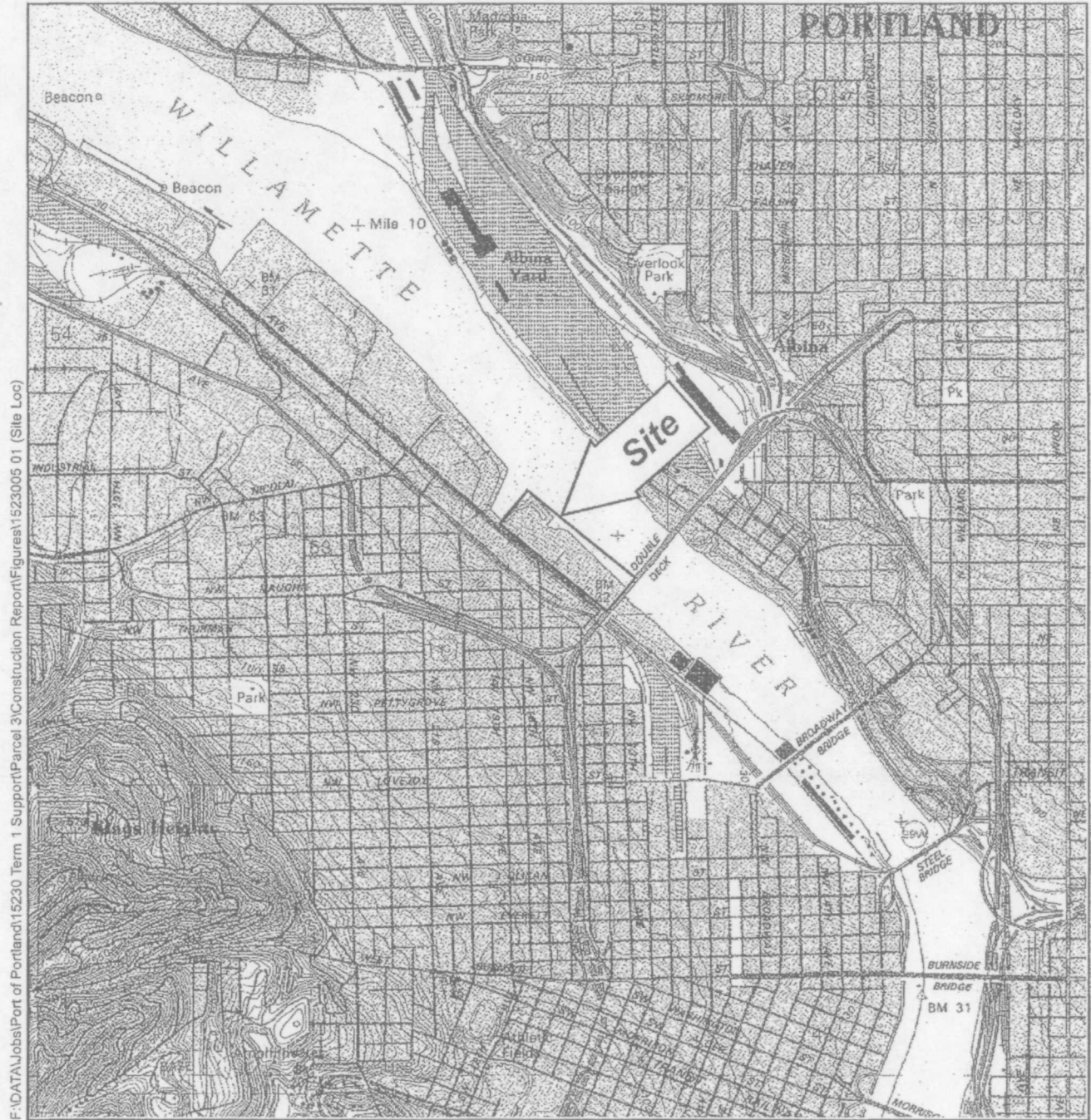
Sample Number Sample Date Sample Depth	Stockpile 1 12/11/02 Composite	Stockpile 2 12/11/02 Composite	Stockpile 3 12/11/02 Composite	Stockpile 4 12/11/02 Composite	Stockpile 5 12/11/02 Composite	Stockpile 6 12/11/02 Composite	Stockpile 7 12/11/02 Composite	Stockpile 8 12/11/02 Composite	Human Health Cleanup Levels Urban Residential 0 - 3 feet
<b>PAHs (EPA 8270 SIM)</b>									
	Concentration in mg/kg (ppm)								
Acenaphthene	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.0268	< 0.0134	--
Acenaphthylene	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	0.0291	< 0.0134	--
Anthracene	< 0.067	0.0733	< 0.067	< 0.067	< 0.067	< 0.067	0.0561	< 0.0134	--
Benzo(a)anthracene	0.157	0.181	0.0764	0.0878	0.124	0.181	0.140	< 0.0134	2.9
Benzo(a)pyrene	0.173	0.207	0.113	0.103	0.154	0.153	0.186	< 0.0134	0.29
Benzo(b)fluoranthene	0.158	0.156	0.108	0.0923	0.125	0.186	0.139	< 0.0134	2.9
Benzo(g,h,i)perylene	0.148	0.186	0.116	0.113	0.141	0.133	0.168	< 0.0134	--
Benzo(k)fluoranthene	0.127	0.147	0.073	0.0803	0.114	0.134	0.167	< 0.0134	--
Chrysene	0.193	0.222	0.109	0.117	0.163	0.201	0.197	< 0.0134	--
Dibenzo(a,h)anthracene	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	0.0309	< 0.0134	0.29
Fluoranthene	0.339	0.401	0.222	0.196	0.252	0.287	0.354	< 0.0134	--
Fluorene	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	0.028	< 0.0134	--
Ideno(1,2,3-cd)pyrene	0.108	0.119	0.0777	0.0728	0.101	0.0948	0.115	< 0.0134	2.9
Napthalene	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.067	< 0.0268	< 0.0134	--
Phenanthrene	0.266	0.360	0.155	0.154	0.199	0.214	0.271	< 0.0134	--
Pyrene	0.369	0.450	0.253	0.220	0.290	0.399	0.386	< 0.0134	--

**Notes:**

1. Shading represents detected concentrations of listed analyte.
2. mg/kg = milligrams per kilogram (ppm).
3. PAHs = Polynuclear Aromatic Hydrocarbons.

# Site Location Map

Terminal 1 South, Parcel 3 (Area A) Remedial Action  
Port of Portland, Portland, Oregon



Note: Base map prepared from the USGS 7.5-minute quadrangle of Portland, OR dated 1990.

0 2,000 4,000  
Scale in Feet  
Contour Interval 10 Feet

**HARTCROWSER**  
15230-05 1/03  
Figure 1

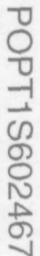
POPT1S602465

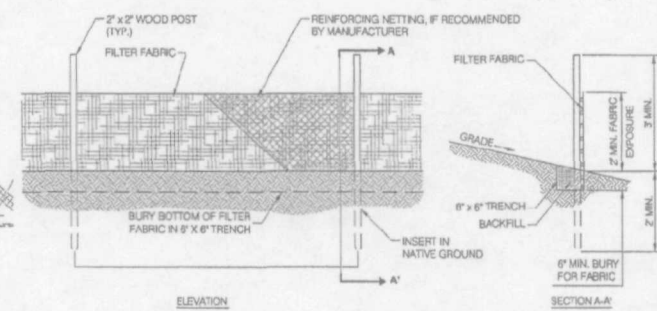
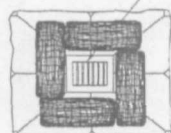
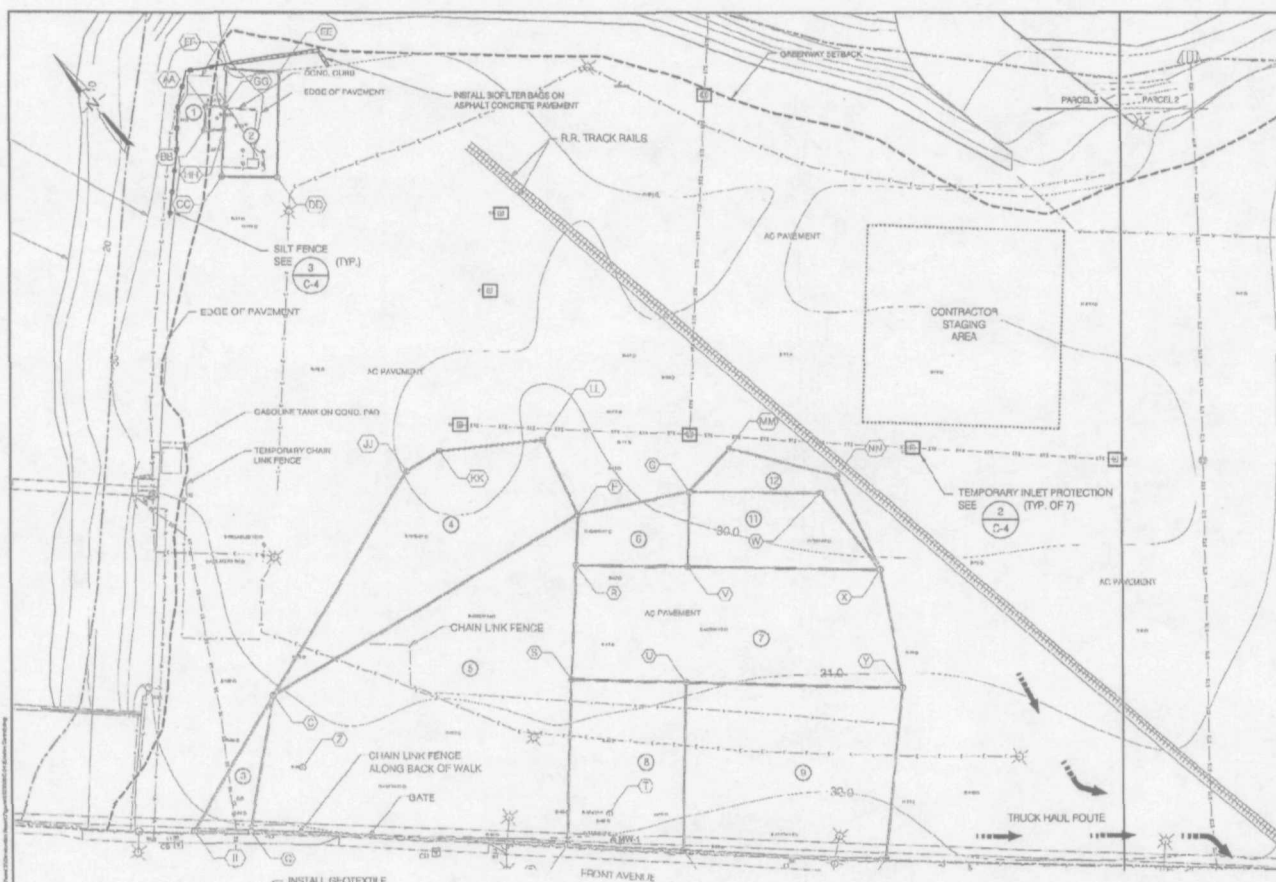
LEGEND:

	FOUND MONUMENT AS NOTED		ROOF DRAIN
	FOUND BENCHMARK		SIGN
	CATCH BASIN		SANITARY SEWER MANHOLE
	FIRE HYDRANT		STORM SEWER MANHOLE
	FIRE DEPT. CONNECTION		WATER MANHOLE
	GAS VALVE		UNDIFFERENTIATED MANHOLE (FROM C.C.P. MAP)
	CLEANOUT		STREET LIGHT/TRAFFIC LIGHT
	BOLLARD		STREET LIGHT/TRAFFIC LIGHT POLE
	WATER VALVE		S/S OUTFALL
	WATER METER		ELECTRICAL LINE
	IRRIGATION VALVE CONTROL		GAS LINE
	TRAFFIC SIGNAL POLE		STORM DRAIN LINE
	JUNCTION BOX		SANITARY SEWER LINE
	TELEPHONE RISER		WATER LINE
	DRYWELL		OVERHEAD POWER OR TELEPHONE LINES
	MONITORING WELL LOCATION AND NUMBER		EXCAVATION AREA DESIGNATION
	GEOTECHNICAL BORING LOCATION AND NUMBER		EXCAVATION STATION DESIGNATION
	ENVIRONMENTAL INVESTIGATION BORING		

												PORT OF PORTLAND PORTLAND, OREGON		DESIGNED BY: H. CLOUGH DRAWN BY: J. ROSSBY CHECKED BY: H. CLOUGH DATE: JUL 2002 SCALE:		TERMINAL 1 - SOUTH REMEDIAL ACTION - PARCEL 3 (AREA A) SYMBOLS AND ABBREVIATIONS			
																SUBMITTED BY: WALTER HAYNES TYPE: CD T1 DRAWING NO.: 2002-501 2/8 (C-2)			

POPT1S602466





- NOTES:
1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
  2. FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS 30 IN. WIDE 30 IN. ROLL TO AVOID JOINTS. ATTACH TO STAKES USING STITCHED LOOPS.
  3. BRUCE JOINTS AT SUPPORT POSTS ONLY, WITH A MIN. 6 IN. OVERLAP.
  4. ANGLE ENDS OF SEDIMENT FENCE UPWIND TO ASSURE SEDIMENT IS TRAPPED.

SEDIMENT FENCE DETAIL

SCALE: NTS

3 C-4

REV	DATE	BY	REVISION	CHKD	APPROV	NO.	DATE	BY	REVISION	CHKD	APPROV
1	11/15/02	HFC	REVISION EXCAVATION LIMITS								



PORT OF PORTLAND  
PORTLAND, OREGON

**HART-CROWDER**

DESIGNED BY: H. CLOUGH

DRAWN BY: J. BISHOP

CHECKED BY: H. CLOUGH

DATE: NOV 2002

SCALE: 1"=30'

TERMINAL 1 - SOUTH

REMEDIAL ACTION - PARCEL 3 (AREA A)

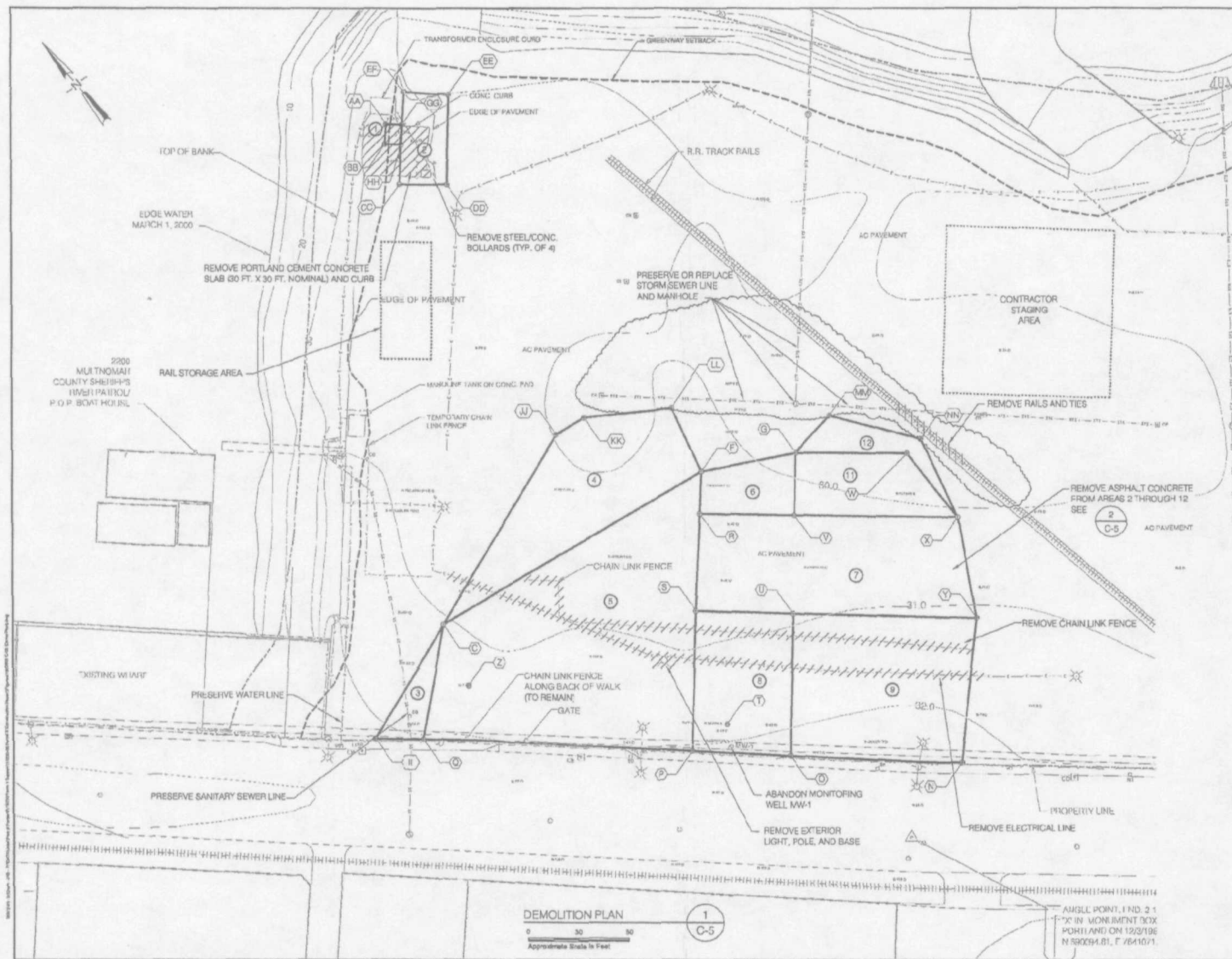
EROSION CONTROL PLAN

SUBMITTED BY: WALTER HAYNES

FILE: CD T1

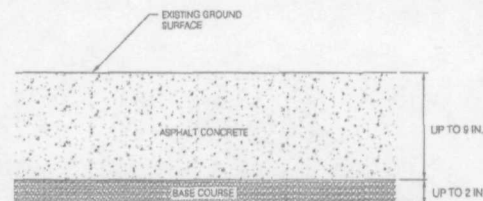
DRAWING NO.: 2002-501

4/8 (C-4)



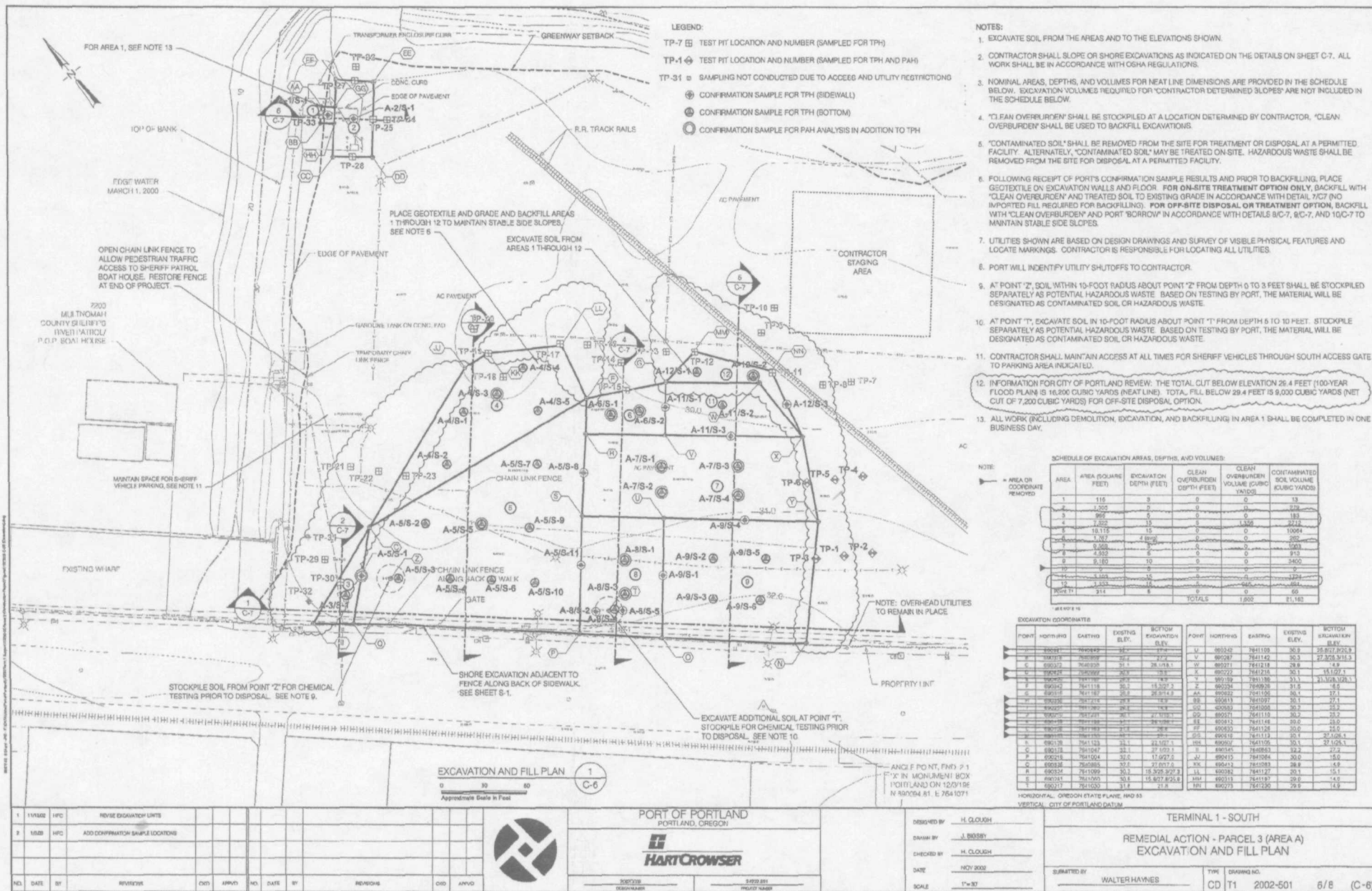
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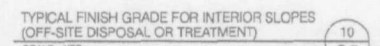
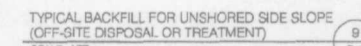
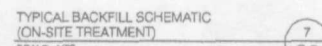
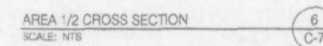
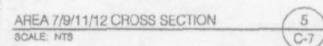
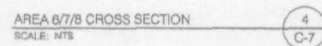
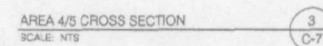
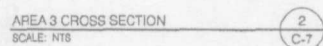
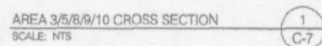
1. RAILS SHALL BE REMOVED TO THE FIRST JOINT OUTSIDE THE EXCAVATION AREA. STACK RAILS IN RAIL STORAGE AREA. REMOVE ANY ASPHALT CONCRETE OR SOIL CLINGING TO RAILS.
2. RAILROAD TIES SHALL BE RECYCLED OR DISPOSED OF OFF-SITE AT A PERMITTED FACILITY.
3. ASPHALT CONCRETE AND PORTLAND CEMENT CONCRETE SHALL BE RECYCLED OR DISPOSED OF OFF-SITE AT A PERMITTED FACILITY.
4. UNLESS INDICATED OTHERWISE ON DRAWINGS, ASPHALT CONCRETE AND PORTLAND CEMENT CONCRETE SHALL BE SAWCUT OR REMOVED TO A JOINT. CUTS SHALL BE 1 FOOT (NOMINAL) FROM PROPOSED EDGE OF EXCAVATION. PROPOSED EDGE OF EXCAVATION SHALL ACCOMMODATE "CONTRACTOR DETERMINED SLOPES".
5. UTILITIES SHOWN ARE BASED ON DESIGN DRAWINGS (SEE REFERENCE DRAWINGS) AND SURVEY OF VISIBLE PHYSICAL FEATURES AND LOCATE MARKINGS. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES.
6. PORT WILL IDENTIFY UTILITY SHUTOFFS TO CONTRACTOR.
7. HASH MARKS ("///") DENOTE SPECIFIC ITEMS TO BE DEMOLISHED.



EXISTING ASPHALT CONCRETE DETAIL 2 C-5  
SCALE: NTS

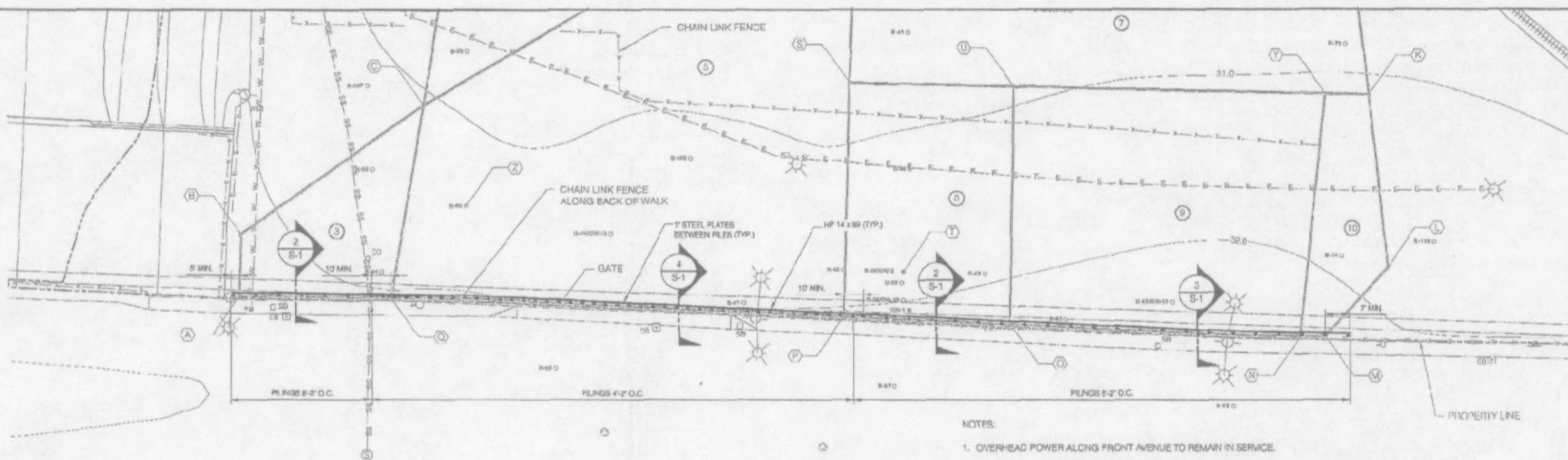
<p>1 11/1/00 HFD REUSE EXCAVATION DEMOLITION LIMITS</p>										<p>PORT OF PORTLAND PORTLAND, OREGON</p>										<p>DESIGNED BY: H. C. CLOUGH DRAWN BY: J. B. BROWN CHECKED BY: H. C. CLOUGH DATE: NOV 2003 SCALE: 1"=30'</p>										<p>TERMINAL 1 - SOUTH REMEDIAL ACTION - PARCEL 3 (AREA A) DEMOLITION PLAN</p>									
<p>NO. DATE BY REVISIONS CVD APPROV. NO. DATE BY</p>										<p>PROJECT DESIGNER: [Signature]</p>										<p>SUBMITTED BY: WALTER J. JAYNES</p>										<p>TYPE: DRAWING NO. CD T1 2002-501 5/8 (C-5)</p>									





**HARTCROWSER**

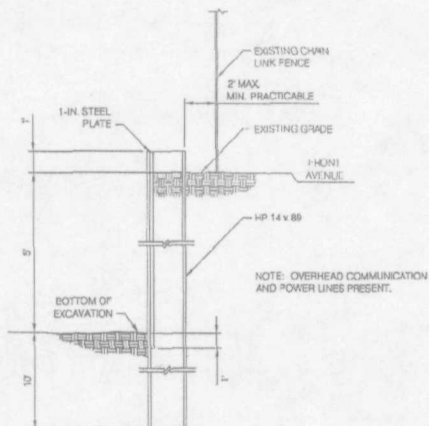
TERMINAL 1 - SOUTH			
REMEDIAL ACTION - PARCEL 3 (AREA A) EXCAVATION DETAILS			
SUBMITTED BY WALTER HAYNES	TITLE CD T1	DRAWING NO. 2002-501	7/8 (C-7)



SHORING PLAN  
SCALE: NTS

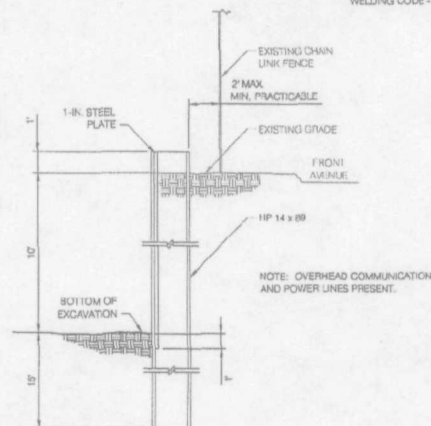
1  
S-1

- NOTES:
1. OVERHEAD POWER ALONG FRONT AVENUE TO REMAIN IN SERVICE.
  2. CONTRACTOR TO OBTAIN STREET CLOSURE PERMIT IF NEEDED FOR SHORING INSTALLATION OR REMOVAL.
  3. CONTRACTOR TO LAY OUT PILING AS NECESSARY TO AVOID OVERHEAD OBSTRUCTIONS.
  4. STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 36/A 563, "STANDARD SPECIFICATIONS FOR CARBON STRUCTURAL STEEL".
  5. WELDING (WHERE NECESSARY) SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF AWS D1.1, "STRUCTURAL WELDING CODE - STEEL".



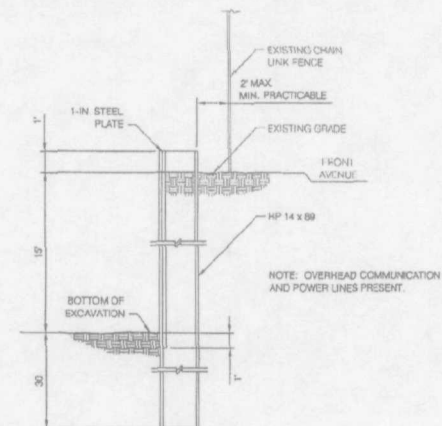
SECTION AT STREET -  
AREA 3, 8, AND 10  
SCALE: NTS

2  
S-1



SECTION AT STREET - AREA 9  
SCALE: NTS

3  
S-1



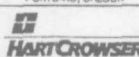
SECTION AT STREET - AREA 5  
SCALE: NTS

4  
S-1

NO.	DATE	BY	REVISIONS	CHKD	APP'D	DATE	BY	REVISIONS	CHKD	APP'D



PORT OF PORTLAND  
PORTLAND, OREGON



DESIGN NUMBER PROJECT NUMBER

DESIGNED BY: S. ALBRITCH  
CHECKED BY: J. BERRY  
DATE: JUL 2002  
SCALE: AS NOTED

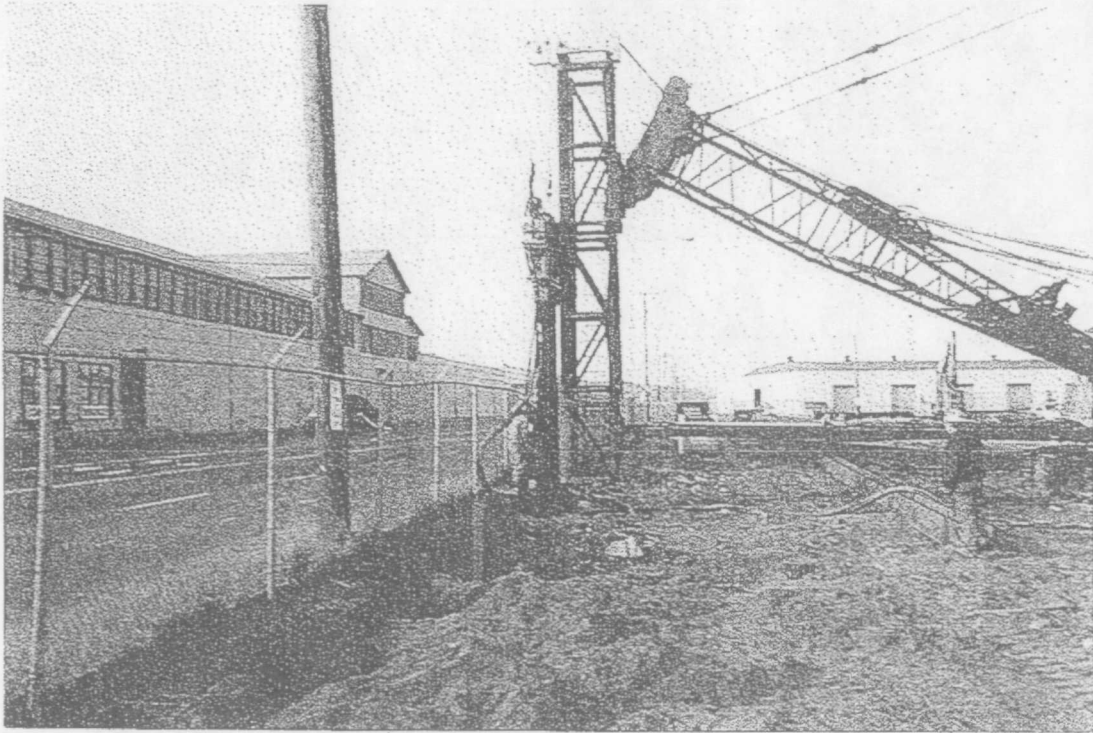
TERMINAL 1 - SOUTH

REMEDIAL ACTION - PARCEL 3 (AREA A)  
SHORING DETAILS

SUBMITTED BY: WALTER HAYNES

TYPE: CD T1  
DRAWING NO.: 2002-501  
8/8 (S-1)

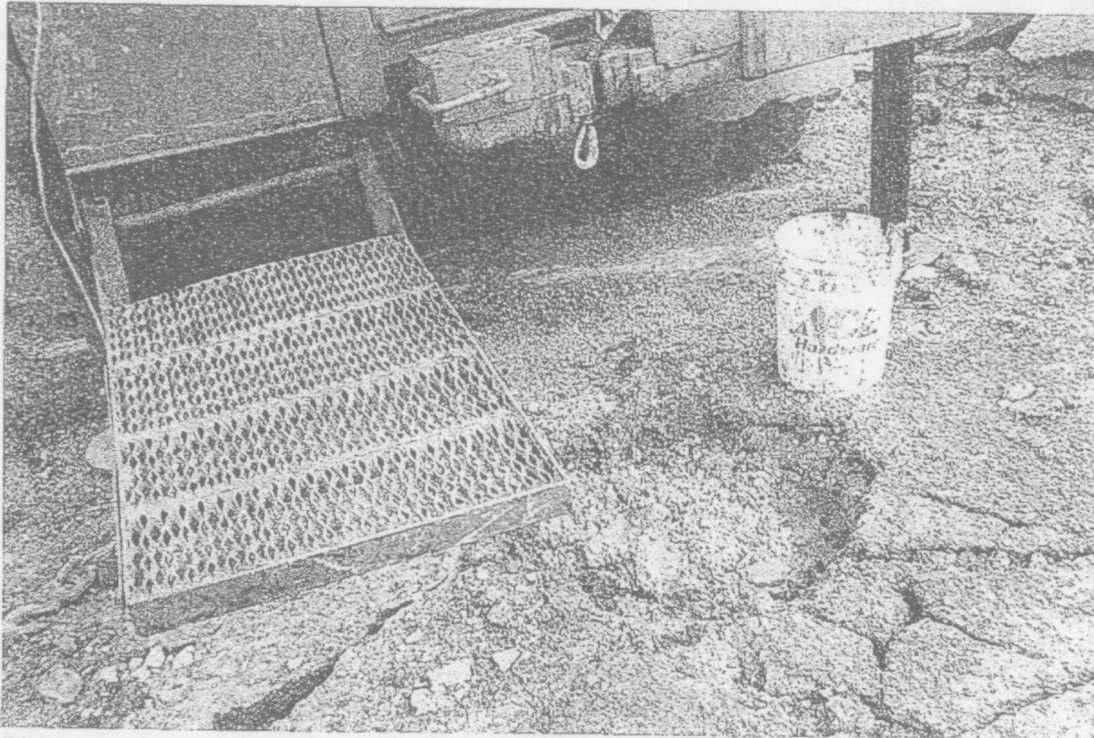
**APPENDIX A  
PHOTOGRAPHS**



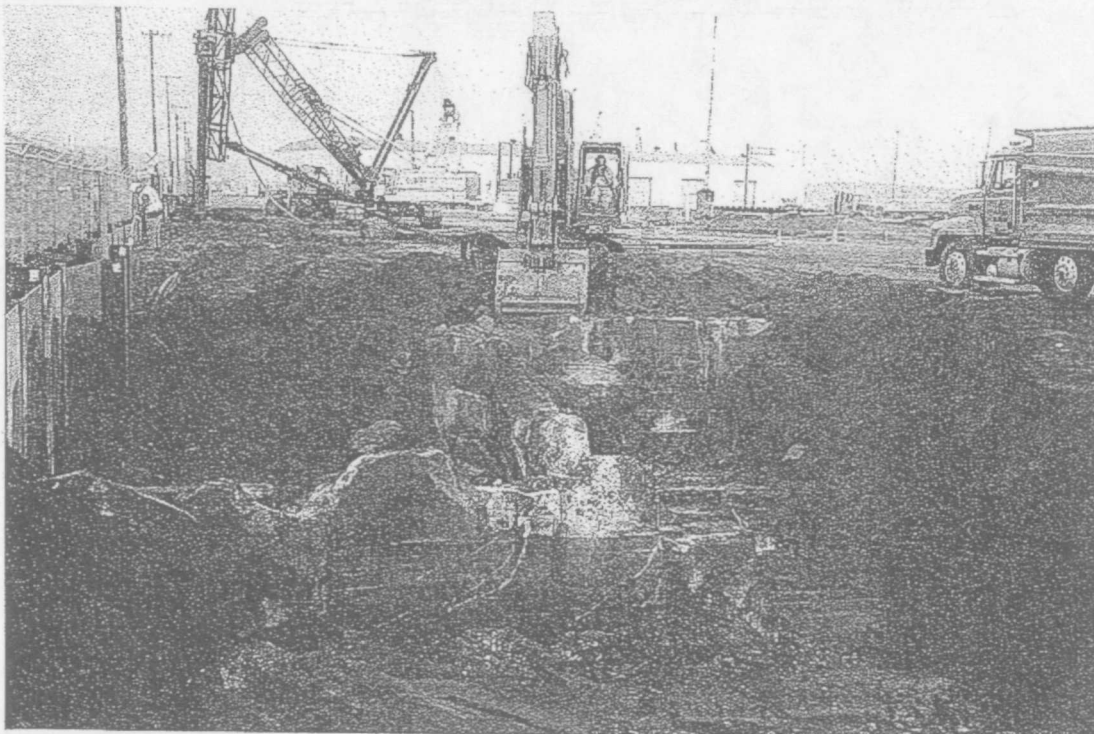
Photograph 1 - Shoring installation (typical) along Front Avenue (looking north).



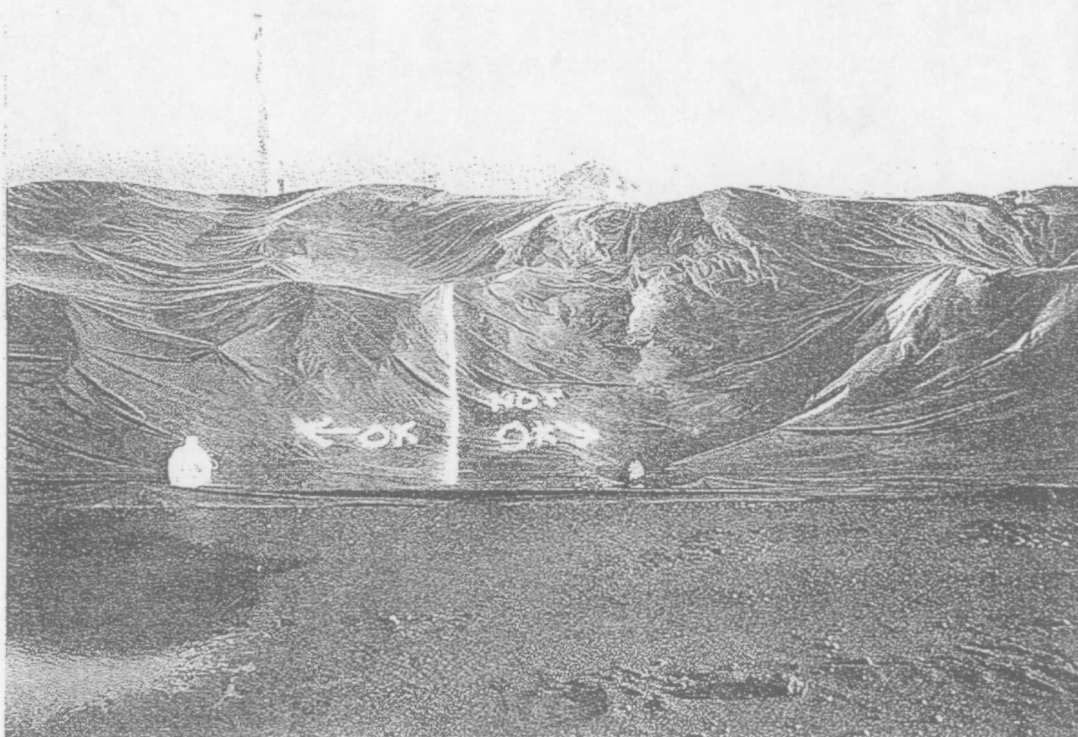
Photograph 2 - Shoring/bracing (typical) along Front Avenue (Area 9, looking southwest).



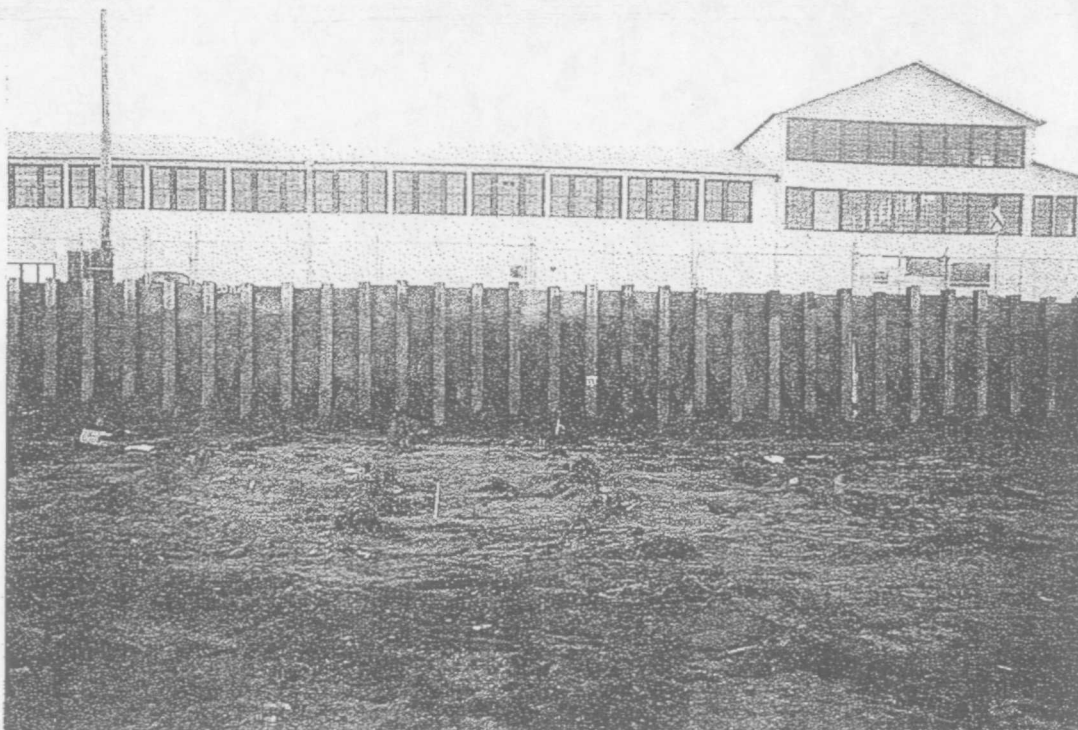
Photograph 3 - Monitoring well abandonment (MW-1).



Photograph 4 - Concrete structure encountered/removed in Area 9 (looking north).



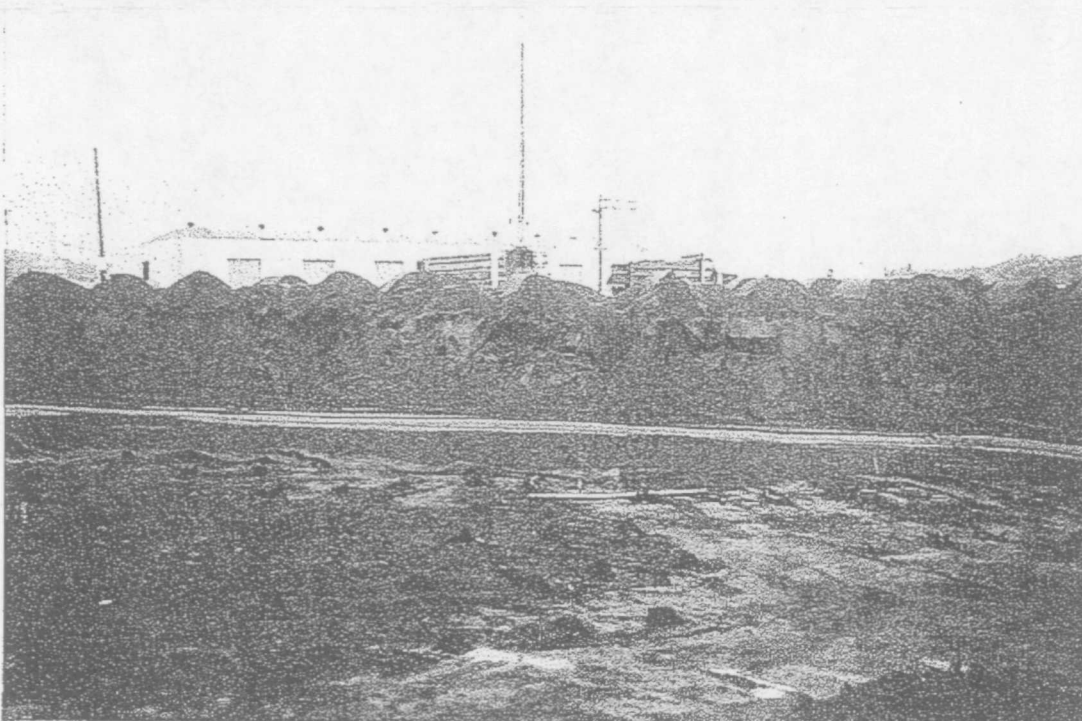
Photograph 5 - Portion of stockpile deemed unsuitable for use as on-site fill.



Photograph 6 - Area 5 excavation (excavation 15 feet deep, looking towards Front Avenue).



Photograph 7 - Area 9 excavation (excavation 10 feet deep, looking northwest).



Photograph 8 - Typical backfilling. Note demarcation layer (Geotextile).



Photograph 9 - Typical perimeter excavation sideslopes (2H:1V).



Photograph 10 - Five-foot wide bench with sideslope tapering away from bench at 2H:1V (looking north).



Photograph 11 - Compacting with smooth-drum vibratory roller along shoring in Area 5 (looking north).



Photograph 12 - Compacting perimeter sideslopes with tamping of trackhoe bucket (looking northeast).

**APPENDIX B**  
**FIELD AND SAMPLING PROCEDURES, EXPLORATION LOGS,**  
**AND WELL ABANDONMENT DOCUMENTATION**

## **APPENDIX B**

### **FIELD AND SAMPLING PROCEDURES AND EXPLORATION LOGS**

This appendix presents the field and sampling procedures that Hart Crowser used to complete this project.

#### **1.0 FIELD AND SAMPLING PROCEDURES**

The locations and basis for soil sampling are discussed in the Removal Action Work Plan (Hart Crowser, 2002d). Soil samples collected from test pit explorations were completed to define the lateral extent of perimeter excavation areas. Soil samples collected from the excavation bottom and sidewalls were used to verify that remedial action cleanup objectives had been attained, document remaining soil contaminant concentrations, and assist in future risk-based calculations. Soil samples collected from the stockpile (i.e., the stockpile generated from excavation of overburden soil [ground surface to 5 feet below ground surface (bgs)] from excavation areas 4 and 12) were used to determine suitability as on-site fill and for waste designation purposes. The field and sampling procedures include the following:

- Test pit explorations;
- Collection of soil samples;
- Field screening;
- Sample management (e.g., containers, storage, and shipment); and
- Decontamination procedures.

#### **1.1 Test Pit Explorations**

Test pit explorations were completed for the purpose of further defining the lateral extent of the perimeter of the removal (excavation areas 3, 4, 6, 7, 10, and 12). The test pit exploration locations are shown on Drawing C-6. Terra Hydr of Portland, Oregon, completed the test pit explorations with a trackhoe, under subcontract to Hart Crowser. A Hart Crowser representative was present to observe and document the excavation activities. We maintained detailed field logs for each test pit. Test pit boring logs are provided in this appendix.

Thirty-one test pit explorations (TP-1 through TP-30 and TP-33) were completed at the locations shown on Drawing C-6. Proposed test pit exploration TP-31 and TP-32 were not completed due to access and utility restrictions. The test pit

explorations were completed to a depth of 9 feet bgs and were sampled at three depth intervals (2 to 3, 5, and 9 feet bgs).

**Abandonment.** After logging and sampling of a test pit was completed, the exploration was backfilled in reverse order (last out, first in) with the excavated soil. Soil was compacted using the trackhoe bucket.

## **1.2 Soil Sample Collection**

Soil samples were collected from the excavation bottom and sidewalls, stockpiles, and test pits. Field observations were maintained in our field log notes. These observations included the following:

- Sampling location;
- Soil characteristics (odor, sheen, presence of wood or other debris, staining, color, grain size); and
- Stockpile volumes.

**Test Pit.** Test pit excavations were completed to depths greater than 4 feet; so the sample was collected from the trackhoe bucket after obtaining a scoop from the location designated by the Hart Crowser representative. The material was placed in laboratory-supplied sample jars using a stainless steel spoon. Two jars were filled. Soil samples were screened in the field for the presence of VOCs using a PID and for petroleum hydrocarbons (i.e., oils) using a sheen test. See Section 1.3 for a description of field screening methods.

**Excavation Bottom and Sidewalls.** Samples were collected from the excavation bottom and sidewalls to provide representative coverage (see Drawing C-6 for sample locations). If the excavation was sloped so it could be safely entered, discrete soil samples were collected with a stainless steel spoon directly from the excavation sidewall or bottom. Prior to obtaining the sample, surficial soil from the excavation wall was removed with a shovel or stainless steel spoon to expose fresh soil. If the excavation was greater than 4 feet and not safe to enter, the sample was collected from the trackhoe bucket after obtaining a scoop from the location designated by the Hart Crowser representative. The material was placed in laboratory-supplied sample jars using the stainless steel spoon. Two jars were filled from the bowl. Soil samples were screened in the field for the presence of volatile organic compounds (VOCs) using a photoionization detector (PID) and for petroleum hydrocarbons (i.e., oils) using a sheen test. See Section 1.3 for a description of field screening methods.

**Stockpile Collection.** Soil samples were collected from two stockpiles generated from excavation of clean overburden soil from excavation areas 4 and 12. One composite sample was collected for each 200 cubic yards (or portion thereof) of soil in the stockpile. Composite samples were collected by obtaining equal aliquots from five locations in the stockpile. The aliquots were placed in a stainless steel bowl, mixed thoroughly, and placed in a laboratory-supplied sample jar using the stainless steel spoon. Two jars were filled. Soil samples were screened in the field for the presence of VOCs using a PID and for petroleum hydrocarbons (i.e., oils) using a sheen test. See Section 1.3 for a description of field screening methods.

**Sample Locations.** Sample locations and explorations were located in the field by measuring distances relative to permanent site landmarks using a measuring tape. At least two fixed, known points were used as a reference for each sampling/exploration location.

### **1.3 Field Screening**

**Headspace Measurements.** PID headspace measurements were made on soil samples to assess the relative presence of VOCs. The PID only provides a qualitative indication of the presence of VOCs and is not compound or concentration-specific. Samples were placed in glass jars (filled less than half full), covered with aluminum foil prior to capping, and allowed to warm to ambient temperatures. PID measurements were made within one hour of collection by pushing a 10.2eV probe through the foil cover. Measurements were recorded in field notes.

**Sheen Tests.** Sheen tests were conducted on soil samples to assess if petroleum hydrocarbons (i.e., oil) were present. A small portion of a sample was placed in a wide-mouth, glass jar filled with water. The presence of petroleum hydrocarbons was indicated if a sheen was produced on the water surface in the jar. Observations were recorded in our field notes.

### **1.4 Sample Management**

Clean sample containers were provided by the analytical laboratory ready for sample collection. A sample label was affixed to each sample container and was marked with a unique sample number, date of collection, project number, and sampler's initials. Samples were placed in a cooler with ice until transported to our office or the laboratory for refrigeration. Chain of custody was maintained and documented at all times.

### **1.5 Decontamination**

To prevent sample contamination, all sampling equipment (stainless steel spoons and bowls) was cleaned using an initial freshwater rinse, successive washes withalconox solution, and a final rinse with deionized water prior to and between collection activities. To avoid cross-contamination of samples, fresh gloves were worn for each new sampling location. Decontamination water was applied to soil designated for disposal.



# Key to Exploration Logs

## Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:

Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

## Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance.

Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

SAND or GRAVEL	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSF
<u>Density</u>		<u>Consistency</u>		
Very loose	0 - 4	Very soft	0 - 2	<0.125
Loose	4 - 10	Soft	2 - 4	0.125 - 0.25
Medium dense	10 - 30	Medium stiff	4 - 8	0.25 - 0.5
Dense	30 - 50	Stiff	8 - 15	0.5 - 1.0
Very dense	>50	Very stiff	15 - 30	1.0 - 2.0
		Hard	>30	>2.0

## Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptible moisture, probably above optimum

## Minor Constituents

### Estimated Percentage

Not Identified in description	0 - 5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

## Legends

### Sampling Test Symbols

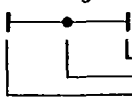
#### BORING SAMPLES

- ☒ Split Spoon
- ☒ Tube (Shelby, Push Probe)
- ☒ Cuttings
- ☒ Core Run
- No Sample Recovery
- P Tube Pushed, Not Driven

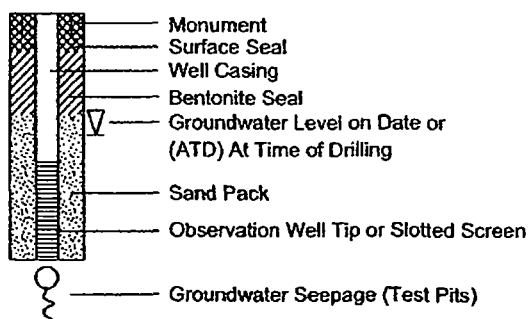
#### TEST PIT SAMPLES

- ☒ Grab (Jar)
- ☒ Bag
- ☒ Shelby Tube

## Test Symbols

- NS No Sheen
- SS Slight Sheen
- MS Moderate Sheen
- HS Heavy Sheen
- TCD Triaxial Consolidated Drained
- QU Unconfined Compression
- DS Direct Shear
- K Permeability
- PP Pocket Penetrometer  
Approximate Compressive Strength in TSF
- TV Torvane  
Approximate Shear Strength in TSF
- CBR California Bearing Ratio
- MD Moisture Density Relationship
- AL Atterberg Limits
  -  Water Content in Percent
  - Liquid Limit
  - Natural Plastic Limit
- PID Photoionization Detector Reading
- CA Chemical Analysis
- DT In Situ Density Test

## Groundwater Observations



KEY SHEET 1523005 (TP 1-33) GPJ HC OREGON.GDT 2/6/03

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Figure B-1

POPT1S602486

## Test Pit Log TP- 1

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	6" Asphalt concrete.
			1	Base gravel.
			2	(Loose), damp, light brown SAND.
TP-1 (2-3)	No Sheen	<5	3	
			4	
TP-1 (5)	No Sheen	<5	5	
			6	Bottom of Exploration at 5.0 Feet.
			7	Completed 10/09/02.
			8	
			9	
			10	

## Test Pit Log TP- 2

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	6" Asphalt concrete.
			1	Base gravel.
			2	(Loose), damp, light brown SAND.
TP-2 (2-3)	No Sheen	<5	3	
			4	
TP-2 (5)	No Sheen	<5	5	
			6	Bottom of Exploration at 5.0 Feet.
			7	Completed 10/09/02.
			8	
			9	
			10	

2 LOGS PER PAGE 1523005 (TP 1-33).GPJ HC OREGON.GDT 2/6/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.

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Figure B-2

POPT1S602487

## Test Pit Log TP- 3

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	6" Asphalt concrete.
			1	Base gravel.
			2	(Loose), damp, light brown SAND.
TP-3 (2-3)	No Sheen	<5	3	
			4	(Medium dense), damp, light brown, sandy GRAVEL.
TP-3 (5)	No Sheen	<5	5	
			6	Bottom of Exploration at 5.0 Feet.
			7	Completed 10/09/02.
			8	
			9	
			10	

## Test Pit Log TP- 4

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	Base gravel.
			2	(Loose), moist, light brown SAND.
TP-4 (2-3)	No Sheen	<5	3	
			4	Bottom of Exploration at 3.0 Feet.
			5	Completed 10/09/02.
			6	
			7	
			8	
			9	
			10	

2 LOGS PER PAGE 1523005 (TP 1-33) GPJ HC OREGON.GDT 2/6/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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Figure B-3

POPT1S602488

## Test Pit Log TP- 5

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
TP-5 (2-3)	No Sheen	<5	0	4" Asphalt concrete.
			1	8" Base gravel.
			2	(Loose), moist, light brown SAND.
			3	Bottom of Exploration at 3.0 Feet. Completed 10/09/02.
			4	
			5	
			6	
			7	
			8	
			9	
			10	

## Test Pit Log TP- 6

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
TP-6 (2-3)	No Sheen	<5	0	4" Asphalt concrete.
			1	8" Base gravel.
			2	(Loose), moist, light brown SAND.
			3	Bottom of Exploration at 3.0 Feet. Completed 10/09/02.
			4	
			5	
			6	
			7	
			8	
			9	
			10	

2 LOGS PER PAGE 1523005 (TP 1-33).GP J HC OREGON.GDT 2/6/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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Figure B-4

POPT1S602489

## Test Pit Log TP- 7

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-7 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-7 (5)	No Sheen	<5	5	
			6	Becomes moist.
			7	
			8	
TP-7 (9)	No Sheen	<5	9	
			10	Bottom of Exploration at 9.0 Feet. Completed 10/09/02.

## Test Pit Log TP- 8

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-8 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-8 (5)	No Sheen	<5	5	
			6	
			7	
			8	
TP-8 (9)	No Sheen	<5	9	
			10	Bottom of Exploration at 9.0 Feet. Completed 10/09/02.

2 LOGS PER PAGE 1523005 (TP 1-33).GPJ MC OREGON.GDT 2/5/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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Figure B-5

POPT1S602490

## Test Pit Log TP- 9

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-9 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-9 (5)	No Sheen	<5	5	
			6	
			7	
			8	
TP-9 (9)	No Sheen	<5	9	
			10	Bottom of Exploration at 9.0 Feet. Completed 10/09/02.

## Test Pit Log TP-10

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-10 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-10 (5)	No Sheen	<5	5	
			6	
			7	
			8	
TP-10 (9)	No Sheen	<5	9	
			10	Bottom of Exploration at 9.0 Feet. Completed 10/09/02.

2 LOGS PER PAGE 1523005 (TP 1-33), GPJ HC OREGON, GDT 2/6/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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Figure B-6

POPT1S602491

## Test Pit Log TP-11

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-11 (2-3)	No Sheen	<5	2	
			3	
TP-11 (5)	No Sheen	<5	4	Minor debris encountered from 4' to 9'.
			5	
			6	
			7	
			8	
TP-11 (9)	No Sheen	<5	9	Bottom of Exploration at 9.0 Feet.
			10	Completed 10/09/02.

## Test Pit Log TP-12

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-12 (2-3)	No Sheen	<5	2	
			3	
TP-12 (5)	No Sheen	<5	4	Minor debris encountered from 4' to 9'.
			5	
			6	
			7	
			8	
TP-12 (9)	No Sheen	<5	9	Bottom of Exploration at 9.0 Feet.
			10	Completed 10/09/02.

2 LOGS PER PAGE 1523005 (TP 1-33).GPJ HC OREGON.GDT 2/6/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.

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Figure B-7

POPT1S602492

## Test Pit Log TP-13

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-13 (2-3)	No Sheen	<5	2	
			3	Becomes gravelly with some debris.
TP-13 (5)	No Sheen	<5	4	
			5	(Loose), damp, light brown SAND with minor gravels.
			6	
			7	
			8	
TP-13 (9)	No Sheen	<5	9	
			10	Bottom of Exploration at 9.0 Feet. Completed 10/09/02.

## Test Pit Log TP-14

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND with minor gravels.
TP-14 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-14 (5)	No Sheen	<5	5	
			6	Bottom of Exploration at 5.0 Feet. Completed 10/09/02.
			7	
			8	
			9	
			10	

2 LOGS PER PAGE 1523005 (TP 1-33).GPJ HC OREGON.GDT 2/6/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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Figure B-8

POPT1S602493

## Test Pit Log TP-15

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND with minor gravels.
TP-15 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-15 (5)	No Sheen	<5	5	
			6	Bottom of Exploration at 5.0 Feet.
			7	Completed 10/09/02.
			8	
			9	
			10	

## Test Pit Log TP-16

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-16 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-16 (5)	No Sheen	<5	5	
			6	(Medium dense), moist, brown and gray, silty SAND.
			7	
			8	
TP-16 (9)	No Sheen	<5	9	
			10	Bottom of Exploration at 9.0 Feet.
				Completed 10/09/02.

2 LOGS PER PAGE 1523005 (TP 1-33).GPJ HC OREGON.GDT 2/8/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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Figure B-9

POPT1S602494

## Test Pit Log TP-17

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete. Base gravel.
			1	
TP-17 (2-3)	No Sheen	<5	2	(Loose), damp, light brown SAND.
			3	
TP-17 (5)	Slight Sheen	<5	4	(Medium dense), moist, brown and gray, silty SAND with some debris.
			5	
			6	
			7	
			8	
TP-17 (9)	Slight Sheen	<5	9	Bottom of Exploration at 9.0 Feet. Completed 10/09/02.
			10	

## Test Pit Log TP-18

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete. Base gravel.
			1	
TP-18 (2-3)	Slight Sheen	<5	2	(Loose), damp, brown and gray SAND.
			3	
TP-18 (5)	Slight Sheen	<5	4	(Medium dense), moist, brown and gray, silty SAND with some debris.
			5	
			6	
			7	
			8	
TP-18 (9)	Slight Sheen	<5	9	Bottom of Exploration at 9.0 Feet. Completed 10/10/02.
			10	

2 LOGS PER PAGE 1523005 (TP 1-33).GPJ HC OREGON.GDT 2/8/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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Figure B-10

POPT1S602495

## Test Pit Log TP-19

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete. Base gravel.
			1	
TP-19 (2-3)	Slight Sheen	<5	2	(Loose), damp, brown and gray SAND.
			3	
			4	
TP-19 (5)	Slight Sheen	<5	5	(Medium dense), moist, brown and gray, silty SAND.
			6	
			7	
			8	
TP-19 (9)	Slight Sheen	<5	9	Bottom of Exploration at 9.0 Feet. Completed 10/10/02.
			10	

## Test Pit Log TP-20

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete. Base gravel.
			1	
TP-20 (2-3)	No Sheen	<5	2	(Loose), damp, brown and gray SAND.
			3	
			4	(Medium dense), moist, brown and gray, silty SAND.
TP-20 (5)	No Sheen	<5	5	
			6	
			7	
			8	
TP-20 (9)	No Sheen	<5	9	Bottom of Exploration at 9.0 Feet. Completed 10/10/02.
			10	

2 LOGS PER PAGE 1523005 (TP 1-33).GPJ HC OREGON.GDT 2/8/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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Figure B-11

POPT1S602496

## Test Pit Log TP-21

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete. Base gravel.
			1	
TP-21 (2-3)	No Sheen	<5	2	(Loose), damp, light brown SAND.
			3	
			4	
TP-21 (5)	No Sheen	<5	5	
			6	
			7	
			8	
TP-21 (9)	No Sheen	<5	9	
			10	Bottom of Exploration at 9.0 Feet. Completed 10/10/02.

## Test Pit Log TP-22

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete. Base gravel.
			1	
TP-22 (2-3)	No Sheen	<5	2	(Loose), damp, brown SAND.
			3	Concrete platform encountered.
			4	
TP-22 (5)	No Sheen	<5	5	
			6	
			7	
			8	
TP-22 (9)	No Sheen	<5	9	
			10	Bottom of Exploration at 9.0 Feet. Completed 10/10/02.

2 LOGS PER PAGE 1523005 (TP 1-33) GPJ HC OREGON.GDT 2/6/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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10/02

Figure B-12

POPT1S602497

## Test Pit Log TP-23

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	Base gravel.
TP-23 (2-3)	No Sheen	<5	2	(Loose), damp, brown SAND.
			3	Concrete platform encountered.
TP-23 (5)	No Sheen	<5	4	
			5	
			6	
			7	
TP-23 (9)	No Sheen	<5	8	
			9	Bottom of Exploration at 9.0 Feet.
			10	Completed 10/10/02.

## Test Pit Log TP-24

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	Base gravel.
TP-24 (2-3)	No Sheen	<5	2	(Loose), damp, brown SAND.
			3	
TP-24 (5)	No Sheen	<5	4	
			5	Bottom of Exploration at 5.0 Feet.
			6	Completed 10/10/02.
			7	
			8	
			9	
			10	

2 LOGS PER PAGE 1523005 (TP 1-33). GPJ HC OREGON.GDT 26/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



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10/02

Figure B-13

POPT1S602498

## Test Pit Log TP-25

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-25 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-25 (5)	No Sheen	<5	5	
			6	Bottom of Exploration at 5.0 Feet.
			7	Completed 10/10/02.
			8	
			9	
			10	

## Test Pit Log TP-26

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-26 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-26 (5)	No Sheen	<5	5	
			6	Bottom of Exploration at 5.0 Feet.
			7	Completed 10/10/02.
			8	
			9	
			10	

2 LOGS PER PAGE 1523005 (TP 1-33), GPJ HC OREGON, GDT 2/6/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



**HARTCROWSER**

15230-05

10/02

Figure B-14

POPT1S602499

## Test Pit Log TP-27

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt concrete.
			1	8" Base gravel.
				(Loose), damp, light brown SAND.
TP-27 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-27 (5)	No Sheen	<5	5	
				Bottom of Exploration at 5.0 Feet. Completed 10/10/02.
			6	
			7	
			8	
			9	
			10	

## Test Pit Log TP-28

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	6" Asphalt concrete.
			1	6" Base gravel.
				(Loose), damp, light brown, silty SAND.
TP-28 (2-3)	No Sheen	<5	2	
			3	
			4	
TP-28 (5)	No Sheen	<5	5	
				Bottom of Exploration at 5.0 Feet. Completed 10/10/02.
			6	
			7	
			8	
			9	
			10	

2 LOGS PER PAGE 1523005 (TP 1-33).GPJ HC OREGON.GDT 2/8/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



**HARTCROWSER**

15230-05

10/02

Figure B-15

POPT1S602500

## Test Pit Log TP-29

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	8" Asphalt concrete.
			1	8" Base gravel.
			2	(Medium dense), moist, brown, silty SAND.
TP-29 (2-3)	No Sheen	<5	3	
			4	
TP-29 (5)	No Sheen	<5	5	
			6	Bottom of Exploration at 5.0 Feet.
			7	Completed 10/10/02.
			8	
			9	
			10	

## Test Pit Log TP-30

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	4" Asphalt over 6" concrete over 2" asphalt over 6" base gravel.
			1	
			2	(Medium dense), moist, brown and gray, silty SAND.
TP-30 (2-3)	Slight Sheen	<5	3	
			4	
TP-30 (5)	Slight Sheen	<5	5	
			6	Bottom of Exploration at 5.0 Feet.
			7	Completed 10/10/02.
			8	
			9	
			10	

2 LOGS PER PAGE 1523005 (TP 1-33).GPJ HC OREGON.GDT 2/8/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



**HARTCROWSER**

15230-05

10/02

Figure B-16

POPT1S602501

# Test Pit Log TP-33

Sample	Lab Tests	PID	Depth in Feet	SOIL DESCRIPTIONS
			0	6" Asphalt concrete over base gravel.
			1	(Medium dense), moist, brown, silty SAND with minor electrical debris.
TP-33 (2-3)	Slight Sheen	<5	2	
			3	Bottom of Exploration at 3.0 Feet. Completed 10/10/02.
			4	
			5	
			6	
			7	
			8	
			9	
			10	

2 LOGS PER PAGE 1523005 (TP 1-33).GPJ HC OREGON.GDT 2/6/03

1. Refer to Figure B-1 for explanation of descriptions and symbols.
2. Descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Groundwater conditions, if indicated, are at time of excavation. Conditions may vary with time.



**HARTCROWSER**

15230-05

10/02

Figure B-17

POPT1S602502

**APPENDIX C  
CITY PERMITS AND  
COMPACTION RESULTS**



**Office of Planning  
and  
Development Review  
Land Use Review Division**

1900 SW Fourth Ave. Suite 5000  
Portland, Oregon 97201  
Telephone: 503-823-7300  
TDD: 503-823-6868  
FAX: 503-823-5630  
www.opdr.ci.portland.or.us

**Date:** September 24, 2002  
**To:** Interested Person  
**From:** Eric Engstrom, Land Use Review  
503-823-0977

**NOTICE OF A TYPE II DECISION ON A PROPOSAL IN  
YOUR NEIGHBORHOOD**

The Office of Planning and Development Review has approved a proposal in your neighborhood. The reasons for the decision are included in this notice. If you disagree with the decision, you can appeal it and request a public hearing. Information on how to appeal this decision is listed at the end of this notice.

**CASE FILE NUMBER: LU 02-135500 GW EF**

**GENERAL INFORMATION**

**Applicant/Owner:** Tom Boullion  
Port Of Portland  
121 NW Everett  
Portland, OR 97208 Phone: 503-944-7615

**Additional Interest:** Tim Ralston  
Riverscape, LLC  
931 SW King Avenue  
Portland, OR 97201

**Consultants:** Herb Clough  
Hart Crowser  
Five Centerpoint Dr., Ste 240  
Lake Oswego, OR 97035

**Site Address:** 2100 WI/NW Front Ave

**Legal Description:** TL 100, BLOCK 37, SHERLOCKS ADD; LOTS 21 THROUGH 24 (TL 201),  
BLOCK 2, DOSCHERS ADD; LOTS 24 AND 25 (TL 202), BLOCK 2,  
DOSCHERS ADD

**Tax Account No.:** R766004290, R215000030, R215000050

**State ID No.:** 1N1E28DB 100, 1N1E28DB 201, 1N1E28DB 202  
**Quarter Section:** 2828

**Neighborhoods:** Northwest District Association, contact John Bradley at (503) 227-7484

**Within 1000'** Pearl District, contact Patricia Gardner at 503-827-0505.  
Overlook, contact Jerry Lindsey at 503-281-5765.  
Eliot, contact Pauline Bradford at 503-281-6635.

**Business Districts:** Northwest Industrial NA, contact Kent Studebaker at (503) 227-6638

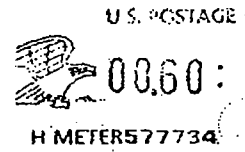
POPT1S602504



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CITY OF PORTLAND  
OFFICE OF PLANNING AND DEVELOPMENT REVIEW  
1900 SW Fourth Avenue, Suite 5000  
Portland, OR 97201 P524

**Land Use Review Notice Enclosed**  
Case # 02-135500 GWEF



MARY GIBSON  
PO BOX 3529  
PORTLAND OR 97208

97208-3529



POPT1S602505

**Within 1000'** Nob Hill Business Association, Libby Hartung at (503) 226-0363  
 Pearl District Business Association, Todd Breslau at (503) 227-3400  
 Lower Albina Council, Kurt Widmer at (503) 331-7241.

**District Coalition:** Neighbors West/Northwest (W/NW), contact David Alred at (503) 223-3331

**Plan District:** Central City Plan District

**Zoning:** RX dg (High density multi-dwelling zone with Design and River General Greenway overlay zones)  
 Central City Plan District, River District Subdistrict  
 Recreational Trail Designation

**Case Type:** GW EF (Greenway Review with concurrent Excavation and Fill Review)

**Procedure:** Type II, an administrative decision with appeal to the Hearings Officer.

**Proposal:** There are a number of areas of soil contamination on this site. Environmental investigations have been completed, and cleanup activities are now proposed for one part of the site (Area of Concern A). Environmental cleanup activities would include excavation, (removal of contaminated soils), shoring up excavated areas, and soil disposal or treatment. The proposed activities include the excavation of approximately 24,900 cubic yards of contaminated soil and subsequent backfilling.

Three recent Land Use Reviews are associated with this site. LUR 01-00618 SU GW approved a tentative plan for a 12-lot subdivision on the site. LUR 01-00682 GW approved demolition of the existing wharf on the river-facing portion of the site. LU 02-116179 GW EF approved similar environmental cleanup within another portion of the site immediately to the southeast (Area of Concern B).

The attached project site plan indicates the proposed areas of work (numbered areas correspond the table at right).

The attached erosion control plan shows proposed contractor staging areas, and proposed entry routes for trucks. Excavation and grading work will occur during normal business hours.

The applicant is considering two options for soil disposal/treatment.

Area	Depth of Excavation	Cubic Yards
1	3	13
2	5	279
3	5	470
4	15	4064
5	15	10064
6	4	262
7	3	1179
8	5	913
9	10	3400
10	5	336
11	15	1724
12	15	2203
"Point T"	5-10	58

Option 1 would involve off-site disposal/treatment. If this option is chosen, the contractor would transport contaminated soils to an appropriate licensed facility for disposal. Option 2 would involve treating the soil on-site with a low-temperature thermal desorption (LTTD) technique. This technique is discussed in the DEQ staff report describing recommended remedial action for the site.

**Relevant Approval Criteria:**

In order to be approved, this proposal must comply with the approval criteria of Title 33. The relevant criteria are:

- 33.440.350 (Greenway Approval Criteria, including the Willamette Greenway Design Guidelines)
- 33.830.050 (Approval Criteria for Excavation and Fill Review)

This application was determined to be complete on August 27th, 2002.

## ANALYSIS

**Site and Vicinity:** The site abuts the Willamette River immediately downstream of the Fremont Bridge (Interstate 405). The property is 300 to 450 feet deep, and about 1,850 feet long. With the exception of the riverbank, the site is relatively flat, with elevations ranging from 29 to 35 feet above sea level (NGVD). The 100-year floodplain elevation at this point in the Willamette River is 28.3 feet above sea level (NGVD). The ordinary high water line is approximately 17 feet above sea level (NGVD).

Until recently, there were a variety of existing port-oriented improvements on the upland portion of the site, including several railroad spurs, several large warehouses, and a water tower. Demolition of these improvements is in progress. Most of the site is paved. There is a large wharf along a portion of the river-facing edge of the site, and a concrete pier extending into the river from the northern corner of the site. In the cove northwest of the site is a floating dock used by the Sheriff's office. There are several large-diameter sewer and stormwater outfall pipes that cross the site in easements.

Immediately southeast of the site is the Fremont Bridge. Traffic lanes of the bridge are elevated about 125 to 175 feet above the ground surface. Beyond the bridge is an office complex with a parking lot. A short segment of completed greenway trail ends at the bridge. To the northwest of the site is another Port of Portland terminal, with a large wharf and several warehouses. Beyond the Port of Portland facilities, the neighborhood to the west of this site is an Industrial Sanctuary (zoned IH). Across the river to the northeast is the Overlook Bluff and the Albina Yards – a large regionally-important railroad switching yard. To the south of the site is an area of industrial warehouses, offices, and industrial buildings, with a more traditional 200-foot by 200-foot block pattern. To the southeast of the site is a large area where a former rail yard is being redeveloped for mixed use and high-density residential uses (the River District).

**Zoning:** The site is zoned RXdg – High Density Residential, with a Design and Greenway General overlay. The site is within the River District subarea of the Central City Plan District. There is also a public recreational trail designation on the site.

The RX Zone is a high-density multi-dwelling zone. Allowed housing developments are characterized by a very high percentage of building coverage. The major types of new housing development will be medium and high rise apartments and condominiums, often with allowed retail, institutional, or other service oriented uses. Generally, RX zones will be located near the center of the city where transit is readily available and where commercial and employment opportunities are nearby. RX zones will usually be applied in combination with the Central City Plan District.

The Design Overlay Zone promotes the conservation, enhancement, and continued vitality of areas of the City with special scenic, architectural, or cultural value. This is achieved through the creation of design districts and applying the Design Overlay Zone as part of community planning projects, development of design guidelines for each district, and by requiring design review or compliance with the Community Design Standards. In addition, Design Review or compliance with the Community Design Standards ensures that certain types of infill development will be compatible with the neighborhood and enhance the area.

The Greenway regulations are intended to:

- Protect, conserve, enhance, and maintain the natural, scenic, historical, economic, and recreational qualities of lands along Portland's rivers;

- Establish criteria, standards, and procedures for the development of land, change of uses, and the intensification of uses within the greenway;
- Increase public access to and along the Willamette River for the purpose of increasing recreational opportunities, providing emergency vehicle access, assisting in flood protection and control, providing connections to other transportation systems, and helping to create a pleasant, aesthetically pleasing urban environment; and
- Implement the City's Willamette Greenway responsibilities as required by ORS 390.310 to 390.368.

The Public Recreational Trail requirements are intended to:

- Increase recreational opportunities within the City of Portland and connect these recreational opportunities with a regional recreational trail system;
- Increase public access along the Willamette River and to other significant natural resource areas;
- Provide emergency vehicle access;
- Provide access to increase public safety;
- Assist in flood protection and control;
- Assist in shoreline anchoring;
- Support alternative modes of transportation;
- Provide connections to other transportation systems;
- Implement the City's Comprehensive Plan policies regarding public recreational trails;
- Help create a pleasant, aesthetically pleasing urban environment; and
- Provide consistent standards for trail development.

The Central City Plan District implements the Central City Plan and other plans applicable to the Central City area. These other plans include the Downtown Plan, the River District Plan, the University District Plan, and the Downtown Parking and Circulation Policy. The Central City Plan District implements portions of these plans by adding code provisions which address special circumstances existing in the Central City area.

**Land Use History:** City records indicate that several prior land use reviews have occurred on this site, including the following:

02-116179 GW EF

A greenway and excavation/fill review to approve environmental cleanup activities (removal of contaminated soil) within the portion of the site that is immediately east of the area subject to this land use review.

01-00682 GW

A greenway review approved demolition of the large wharf located along the river-facing edge of the site. Demolition activities are expected to begin during the summer of 2002.

01-00618 SU GW

A subdivision proposal with concurrent greenway review was submitted in September of 2001. That subdivision would divide the site into 12 lots, with several new public streets. The preliminary subdivision approval was granted by the Hearings Officer on January 4<sup>th</sup>, 2002. An appeal was filed, but City Council upheld the decision in a public hearing on February 14<sup>th</sup>, 2002.

01-00521 GW

A 2001 Greenway Review approved construction of the West Side Combined Sewer Overflow (CSO) tunnel and pipeline project. The CSO Pipe is a 14-foot diameter below-grade tunnel connecting from SW Clay Street along Front Avenue to the Swan Island Pump Station. The tunnel is designed to capture sewage overflows from Portland combined sewers and direct that overflow to treatment facilities. The project is mandated by The Oregon Department of Environmental Quality (DEQ). The CSO tunnel will be located under NW Front Avenue, and impacts the site in two places:

- OPDR-approved plans show an access shaft (manhole) about 150 feet northwest of NW 17<sup>th</sup> Avenue intersection. All construction related to this shaft will be within the right-of-way.
- Just northwest of the Fremont Bridge will be the Fremont Conduit Diversion, a vertical drop structure, and a series of connected pipes and manholes.

There are no conditions of approval from the CSO project review that would impact the present proposal.

99-00995 GW and 01-00111 AD

Two recent land use reviews were related to a proposal to locate kitchen support facilities for a boat moorage located on another portion of the same site. These cases were withdrawn.

98-01041 DZ

A 1998 Design Review approved partial demolition of several warehouses on the site. Design Review was required because the demolitions were only partial. The new exterior walls on several of the buildings were required to be finished to match existing exterior surfaces. These buildings will be completely removed with redevelopment of this site.

D 37-81

An additional 3.5 feet of right-of-way was dedicated to NW Front Avenue in 1981. There were no conditions associated with this approval.

CU 100-75 and CU 75-71

Two land use reviews for excavation and fill were approved within the site in 1971 and 1975. There are no other records or specific plans related to these cases on file with the City.

ZC 4684

There is a record of a Zone Change review covering a large area of West Portland, including this site. No additional documentation of this case is available.

**Agency Review:** The following Bureaus have responded with no issues or concerns:

- Portland Transportation
- Fire Bureau

The Bureau of Environmental Services responded with several comments related to the development of brownfield sites. Please see Exhibit E-1 for additional details.

The Site Development section of OPDR has noted that a Site Development Permit is required to carry out the proposed activities.

**Neighborhood Review:** A "Notice of Proposal in Your Neighborhood" was mailed on August 30th, 2002. No written responses have been received from either the Neighborhood Association or notified property owners in response to the proposal.

## **ZONING CODE APPROVAL CRITERIA**

### **Greenway Review**

#### **33.440.310 Where Greenway Review Applies**

Unless exempted in 33.440.320 below, the following items are subject to greenway review:

- A. New development;**
- B. Exterior alterations to development, including the removal of trees and shrubs and the application of herbicides;**
- C. A change of use or development within or riverward of the greenway setback, where the use or development is no longer river-dependent or river-related;**

- D. Changes to the land and structures in the water, including excavations and fills, bridges, and docks; and
- E. The dedication or extension of rights-of-way and any new development or improvements in rights-of-way when within the River Natural zone or within or riverward of the greenway setback.

**Findings:** Excavation and fill activities are considered exterior alterations, and changes to the land (identified under paragraphs B and E above). Therefore, Greenway Review is required.

### **33.440.320 Exemptions from Greenway Review**

Greenway review is not required for any of the situations listed below. The situations listed below are still subject to the Greenway development standards. The situations are:

- A. As illustrated in Figure 440-2, alterations to development in the River Industrial zone that are outside of the areas listed below:
  - 1. The greenway setback;
  - 2. Riverward of the greenway setback;
  - 3. Within 50 feet landward of the greenway setback; or
  - 4. Within 50 feet of River Natural zoned land;
- B. Alterations to development landward of the greenway setback when not in or within 50 feet of River Natural zoned land, that either do not require a building permit or are valued at less than \$25,000;
- C. Changes to the interior of a building where there are no exterior alterations;
- D. Development of or changes to the greenway trail or access paths provided that all development standards including the standards of 33.272, Recreational Trails, are met. Development of or changes in a viewpoint or view corridor, as indicated on Map 440-1, will require greenway review;
- E. Activities allowed by the base zone which are usual and necessary for the use and enjoyment of an existing house, including the modification of existing accessory structures or facilities, and the construction of driveways;
- F. Excavations and fills under 50 cubic yards;
- G. The normal maintenance and repair necessary for an existing development;
- H. Dredging, channel maintenance, and the removal of gravel from rivers;
- I. Emergency procedures necessary for the safety or protection of property;
- J. The placement of up to 4 single piles, or 2 multiple-pile dolphins for each 100 feet of shoreline for an existing river-dependent or river-related use;
- K. Signs; and
- L. Removal of vegetation identified as nuisance plants on the Portland Plant List.

**Findings:** The site is not within the River Industrial zone. Excavation and fill activities require Site Development permits, and the proposed work is valued at more than \$25,000. The proposed activity is not an activity that is "usual or necessary for the enjoyment of an existing home". The proposed activity is not considered a change to the interior of a building. The proposed excavation/fill is over 50 cubic yards. The proposed work is not considered dredging, normal maintenance and repair, or an emergency procedure. New piles will not be placed within the river with this proposal. No signs are proposed. The proposed demolition does not involve removal of nuisance vegetation.

The proposed demolition does not fit within any of the above-described exemptions. Therefore, Greenway Review is required.

### **33.440.350 Greenway Approval Criteria**

- A. Generally. The approval criteria for a greenway review have been divided by location or situation. The divisions are not exclusive; a proposal must comply with all of the approval criteria which apply to the site. Requests for a greenway review will be approved if the review body finds that the applicant has shown that all of the appropriate approval criteria are met.

**Findings:** Each criterion is discussed below.

- B. For all greenway reviews. The Willamette Greenway Design Guidelines must be met for all greenway reviews.**

**Findings:** There are 8 design guidelines, as follows:

- A - Relationship of Structures to the Greenway Setback Area;
- B - Public Access;
- C - Natural Riverbank and Riparian Habitat;
- D - Riverbank Stabilization;
- E - Landscape Treatments;
- F - Alignment of the Greenway Trail;
- G - Viewpoints; and
- H - View Corridors.

Each of these guidelines is discussed below.

**Issue A. Relationship of Structures to the Greenway Setback Area:**

This issue *"applies to all but river-dependent and river-related industrial use applications for Greenway Approval, when the Greenway Trail is shown on the property in the Willamette Greenway Plan."* These guidelines call for complementary design and orientation of structures so that the greenway setback area is enhanced.

**Findings:** The proposal is to excavate and treat contaminated soil. The contractors will backfill the excavation areas as needed to maintain stability using clean on-site soils. No new structures are proposed with this application. Therefore, this guideline is not applicable.

**Issue B. Public Access:** This issue *"applies to all but river-dependent and river-related industrial use applications for Greenway Approval, when the Greenway Trail is shown on the property in the Willamette Greenway Plan."* These guidelines call for integration of the Greenway Trail into new development, as well as the provision of features such as view points, plazas, or view corridors.

**Findings:** The proposal is to excavate and treat contaminated soil. The contractors will backfill the excavation areas as needed to maintain stability using clean on-site soils. No new development or pedestrian circulation systems are proposed or required. This site is subject to a separate subdivision application (LUR 01-00618 SU GW) that sets in motion the framework for future development of the site. Therefore, this guideline is not applicable to this review.

**Issue C. Natural Riverbank and Riparian Habitat:** This issue *"applies to situations where the river bank is in a natural state, or has significant wildlife-habitat, as determined by the wildlife habitat inventory."* These guidelines call for the preservation and enhancement of natural banks and areas with riparian habitat.

**Findings:** The riverbank at this location is not in a natural state. This site is identified as Site 15.11a and 15.11b within the Lower Willamette River Wildlife Habitat Inventory. This area received a "Rank V" designation due to low wildlife habitat values and because the site was dominated by heavy industrial marine terminal uses, and because the shoreline is significantly modified with wharves, piers, and engineered rock-embankments. This guideline is not directly applicable to this site.

**Issue D. Riverbank Stabilization Treatments:** This issue *"applies to all applications for Greenway Approval."* This guideline promotes bank treatments for upland developments that conserve riparian habitat to the maximum extent practical.

**Findings:** The proposal is to excavate and treat contaminated soil. The contractors will backfill the excavation areas as needed to maintain stability using clean on-site soils. No new riverbank stabilization treatments are proposed or required at this time. This site is subject to a separate subdivision application (LUR 01-00618 SU GW) that sets in motion the framework for future development of the site. Therefore, this guideline is not applicable to this review.

**Issue E. Landscape Treatments:** This issue "applies to all applications for Greenway Approval which are subject to the landscape requirements of the Greenway chapter of Title 33 Planning and Zoning of the Portland Municipal Code." These guidelines call for landscaping treatments which create a balance between the needs of both human and wildlife populations.

These guidelines call for landscaping treatments which create a balance between the needs of both human and wildlife populations:

1. **Landscape Treatment.** *The landscape treatment should create an environment which recognizes both human and wildlife use. Areas where limited human activity is expected should consider more informal riparian treatments. Areas of intense human use should consider a more formal landscape treatment. The top of bank may be considered a transition area between riparian treatment on the riverbank and a more formal treatment of the upland.*
2. **Grouping of Trees and Shrubs.** *In areas of more intense human use, trees and shrubs can be grouped. The grouping of trees and shrubs allows for open areas for human use, and has the secondary value of increasing the value of the vegetation for wildlife.*
3. **Transition.** *The landscape treatment should provide an adequate transition between upland and riparian areas, and with landscape treatments of adjacent properties.*

**Findings:** The proposal is to excavate and treat contaminated soil. The contractor will backfill the excavation areas as needed to maintain stability using clean on-site soils. The attached plans illustrate the portions of the site where work will occur.

#### Code Requirements

The Portland City Council recently amended Chapter 33.440 (by adding Section 020.C) to specify that for soil remediation projects of this type, the landscape requirements of the Greenway Chapter will only apply to the extent that they are applicable to the actual remediation area. In this case most of the proposed excavations are outside of the greenway setback area. Only one area - Remedial Action Area 1, in the northwest corner of the site - is within the greenway setback area (there is about 36 square feet of encroachment, or 12 linear feet of river frontage. Therefore, work within this area would normally trigger greenway setback landscaping.

The greenway landscaping standards are found in section 33.440.230 of the Zoning Code. Those standards would specify the following landscaping in this context:

- One tree every 20 feet of river frontage;
- One shrub per 25 square feet of land riverward of the greenway setback; and
- Remaining areas riverward of the greenway setback must be vegetated with groundcovers;

Therefore, the greenway landscaping standards, strictly interpreted, would normally specify that one tree and two shrubs are required upon completion of the remediation work in Area 1, in order to meet the greenway landscaping standards. This greenway review would then consider the configuration of those plantings.

#### Context of the Proposed Work

This site was recently subject to a separate subdivision application (LUR 01-00618 SU GW) that sets in motion the framework for future development of the site. As part of the subdivision review, the purchaser of this site (Riverscape LLC) submitted a preliminary greenway planting plan showing the conceptual location of future plantings. That review, however, did not result in final approval of the landscape plans presented. The conceptual plans were reviewed during the

subdivision review to determine general feasibility of the subdivision layout - rather than the specific feasibility of the planting plans submitted. During that review process, the Hearings Officer found that the landscaping proposed by Riverscape LLC can meet the requirements of this guideline. Council agreed with the Hearings Officer on appeal.

The Hearings Officer and City Council's recent decision on Riverscape LLC's subdivision proposal is relevant to the present review because it provides context for the eventual planned use of this site. The present review is occurring in order to consider one action within a series of actions leading to the full development of this site. The soil remediation work proposed by the Port of Portland is necessary before the site can be developed for residential uses.

The City is also currently reviewing a proposal by Riverscape LLC to carry out mass grading on the site in preparation for development. This grading would not occur within the contaminated areas until after soil remediation work is complete. Mass grading of the site would also trigger compliance with the greenway setback landscaping standards.

#### Consideration of Guideline E

OPDR planning staff have advised both Riverscape LLC and the Port of Portland that a strict reading of the Zoning Code would require that greenway plantings be installed in conjunction with soil remediation and later site grading. Having said that, however, planning staff recognize that planting at this stage in the development process may not be appropriate, for several reasons:

- This guideline states that landscape plantings should create an environment which recognizes both wildlife and human use. One tree and two shrubs would not create a meaningful wildlife habitat. In addition, planting one tree and two shrubs on the site at this time does not adequately recognize human use of the site. In order to design landscaping on the site that recognizes human use, it would be preferable to design that landscaping in conjunction with the design of the buildings and walkways that will eventually be built here.
- The guideline states that trees and shrubs should be grouped. One tree and two shrubs is not a meaningful grouping considering the size of the site and the environmental context.
- The guideline states that landscaping should provide for an adequate transition between upland and riparian areas. Given that the specific development designs of the abutting upland areas have not yet been reviewed, the present review does not provide adequate context to determine if that objective is met.

#### Greenway Planting Exceptions

The greenway setback landscaping standards include an exception that allows OPDR to waive planting requirements where it is found that they would substantially interfere with river-dependant or river-related use or development.

#### Conclusions

The proposed soil remediation work is related to the decommissioning of river-related the Port facilities that have stood on this site for many years. The Zoning Code defines cleanup activity of this type as river-related development for the duration of the cleanup process. In addition, greenway trail planning is underway for this site, in connection with the subdivision review and final plat review process. The greenway trail is defined as river-related in the Zoning Code. Planting a small cluster of vegetation on the site at this time would not substantially interfere with cleanup activities. Such plantings, however, would interfere with the future greenway trail corridor - because specific plans for the greenway corridor on this site are in the process of being developed, but are not complete. Further greenway trail planning is required, as outlined in the City Council order approving the tentative subdivision plan for this site. It would be inappropriate to require plantings until the specific greenway plans for the site are finalized as envisioned in the recent subdivision decision. Therefore, OPDR may waive compliance with 33.440.230 in this situation, for the proposed remediation work. Landscaping standards will apply to subsequent development activity once the required greenway plans for the anticipated development have been approved.

This guideline is met, for the reasons explained above. The decision in this case will include a statement that the standards of 33.440.230 are waived for purposes of this specific remediation project.

**Issue F. Alignment of Greenway Trail:** This issue *"applies to all applications for Greenway Approval with Greenway Trail shown on the property in the Willamette Greenway Plan."* These guidelines give direction in the proper alignment of the greenway trail and call for consideration of habitat protection, the physical features of the site and the necessity of maintaining year-round use of the trail.

**Findings:** The proposal is to excavate and treat contaminated soil. The contractors will backfill the excavation areas as needed to maintain stability using clean on-site soils. No new buildings or uses are proposed with this application. This site is subject to a separate subdivision application (LUR 01-00618 SU GW) that sets in motion the framework for future development of the site, including dedication of required greenway trail easements on this site. Greenway trail dedication within this site was made a condition of approval of that separate land use review, LUR 01-00618 SU GW. Provided the greenway trail dedication is provided as set forth in LUR 01-00618 SU GW, this criterion will be met.

In addition, it should be noted that there is no impact from the proposed soil remediation activity that would logically lead to a need for a trail dedication at this time (i.e. there is no legal nexus, and any such requirement would not be proportional to the impact of the proposed work). As a result, outside of the subdivision process occurring on this site, no trail can be required as a result of the proposed activity.

**Issue G. Viewpoints:** This issue *"applies to all applications for Greenway Approval with a public viewpoint shown on the property in the Willamette Greenway Plan and for all applications proposing to locate a viewpoint on the property"*. These guidelines provide direction about the features and design of viewpoints, as required at specific locations.

**Findings:** The proposal is to excavate and treat contaminated soil. The contractors will backfill the excavation areas as needed to maintain stability using clean on-site soils. No new structures are proposed with this application. This site is subject to a separate subdivision application (LUR 01-00618 SU GW) that sets in motion the framework for future development of the site, including dedication of required greenway trail easements on this site. A public viewpoint is identified in the Greenway Plan abutting this site – under the Fremont Bridge, adjacent to Lot 1 of the approved subdivision. A Greenway Review and Design Review will be required for development on Lot 1 – and will include consideration of the relationship of those structures to the abutting viewpoint. Because greenway trail dedication within this site was already made a condition of approval of that separate land use review, and because no other new development is proposed at this time that would generate a need for a trail, this guideline is not applicable to this review.

**Issue H. View Corridors:** This issue *"applies to all applications for Greenway Approval with a view corridor shown on the property in the Willamette Greenway Plan"*. These guidelines provide guidance in protecting view corridors to the river and adjacent neighborhoods.

**Findings:** The Willamette Greenway Plan does not include a designated view corridor from or across this property. This issue is not applicable.

**B. River frontage lots in the River Industrial zone.** In the River Industrial zone, uses that are not river-dependent or river-related may locate on river frontage lots when the site is found to be unsuitable for river-dependent or river-related uses. Considerations include such constraints as the size or dimensions of the site, distance or isolation from other river-dependent or river-related uses, and inadequate river access for river-dependent uses.

**Findings:** This site is not within the River Industrial Zone. This criterion is not applicable.

- C. Development within the River Natural zone.** The applicant must show that the proposed development, excavation, or fill within the River Natural zone will not have significant detrimental environmental impacts on the wildlife, wildlife habitat, and scenic qualities of the lands zoned River Natural. The criteria applies to the construction and long-range impacts of the proposal, and to any proposed mitigation measures. Excavations and fills are prohibited except in conjunction with approved development or for the purpose of wildlife habitat enhancement, riverbank enhancement, or mitigating significant riverbank erosion.
- D. Development on land within 50 feet of the River Natural zone.** The applicant must show that the proposed development or fill on land within 50 feet of the River Natural zone will not have a significant detrimental environmental impact on the land in the River Natural zone.

**Findings:** This site is not within the River Natural Zone, or within 50 feet of a River Natural Zone. These criteria are not applicable.

- E. Development within the greenway setback.** The applicant must show that the proposed development or fill within the greenway setback will not have a significant detrimental environmental impact on Rank I and II wildlife habitat areas on the riverbank. Habitat rankings are found in the Lower Willamette River Wildlife Habitat Inventory.

**Findings:** This site does not contain or abut any Rank I or Rank II wildlife habitat areas on the riverbank. This criterion is not applicable.

- G. Development riverward of the greenway setback.** The applicant must show that the proposed development or fill riverward of the greenway setback will comply with all of the following criteria:

1. The proposal will not result in the significant loss of biological productivity in the river;
2. The riverbank will be protected from wave and wake damage;
3. The proposal will not:
  - a. Restrict boat access to adjacent properties;
  - b. Interfere with the commercial navigational use of the river, including transiting, turning, passing, and berthing movements;
  - c. Interfere with fishing use of the river;
  - d. Significantly add to recreational boating congestion; and
4. The request will not significantly interfere with beaches that are open to the public.

**Findings:** A very limited amount of activity is proposed riverward of the greenway setback (a total of 4 cubic yards or 36 square feet).

- Erosion control measures, in accordance with the City of Portland Erosion Control Manual, will be implemented throughout the project area to ensure soil from the excavated areas does not erode into either the street, adjacent properties, or the river. See the attached erosion control plan for more information.
- The applicant has stated that the contractor will be required to complete work within the greenway setback area within a single day – limiting the potential impacts of that work.
- No work is proposed in the river that would interfere with fishing, limit boat access to adjacent properties, or interfere with shipping/boating. Access will be maintained at all times to the Multnomah County Sheriff's Patrol boat house located in the abutting slip north of the work area.

- There are no beaches on this site that are open to the public.

This criterion is met, based on the reasons stated above.

### **Excavation and Fill Review**

#### **33.830.010 Purpose**

The regulations of this chapter are designed to ensure that excavations and fills:

- Will not cause any nuisance or safety problems or loss of development potential in residential and open space areas; and
- Will not have a significant negative impact on any natural resource values in these areas.

The technical and engineering concerns for excavations and fills are addressed by other Bureaus as part of the building permit process.

#### **33.830.020 When Review Is Required**

In the situations stated below, excavations and fills are subject to review.

- Residential and open space zones.** In R and OS zones, excavations and fills over 1,000 cubic yards require an excavation and fill review, except as exempted in 33.830.030 below. R and OS zones with Environmental or Greenway overlay zoning are subject to more restrictive excavation and fill requirements and review. See Chapters 33.430 and 33.440, respectively.
- Commercial, employment, and industrial zones.** In the C, E, and I zones, excavations and fills over 1,000 cubic yards which are within 400 feet of a residential zone require an excavation and fill review, except as exempted in 33.830.030 below. C, E, and I zones with Environmental or Greenway overlay zoning are subject to more restrictive excavation and fill requirements and review. See Chapters 33.430 and 33.440, respectively.

**Findings:** The proposed work takes place within a residential zone, and will involve more than 1000 cubic yards of material. Unless exempted under 33.830.030, Excavation and Fill Review is required.

#### **33.830.030 Exemption from Review**

Except as modified elsewhere in this Title, the following excavations and fills are exempt from the excavation and fill review:

- Those necessary for the preparation of a foundation of a structure or for exterior improvements;**
- Those associated with public improvements regulated under Title 17, Public Improvements, and**
- Those in conjunction with a road grading plan approved as part of a preliminary plan for a PUD or an interim plat for a subdivision by OPDR.**

**Findings:** The proposal is to excavate and treat contaminated soil. The contractors will backfill the excavation areas as needed to maintain stability using clean on-site soils. For permitting purposes, this work is proposed as a stand-alone activity, and no foundations, or other structures have been proposed at this time. This work is not being permitted under the Public Works permitting process, and is not considered a public improvement. The proposed work is not shown on an approved PUD or subdivision plan. Although there is an approved tentative subdivision plan for this site, the proposed soil remediation work was not shown on grading plans presented in conjunction with the subdivision. In addition, a plat for the subdivision of

this site has not been submitted to OPDR for review. Therefore, Excavation and Fill Review is required. The relevant approval criteria are discussed below.

### **33.830.050 Approval Criteria**

**Requests for excavations and fills review will be approved if the review body finds that the applicant has shown that all of the following approval criteria are met:**

**A. Potential on-site or off-site safety hazards will be mitigated, through the use of fencing or other measures;**

**Findings:** The site is gated and fenced to prevent unauthorized entry. Excavated areas that are not backfilled to existing grade will be surrounded by temporary fencing until additional site development is carried out. On-site hazards are therefore mitigated.

If the contractor selects the off-site disposal option, the primary off-site hazard would occur at the location where the contaminated soil will be disposed. The applicant has stated that the excavated materials, if they are not treated on the site using a thermal desorption technology, will be brought to a proper disposal site. If that site is within the City of Portland, disposal must occur in a location consistent with applicable Zoning regulations, and Excavation/Fill Review may be required.

This criterion is met, provided that applicable City requirements are met if material is brought to a disposal site is within the City of Portland.

**B. The hours and total duration of operation will be limited to reduce the impacts on the neighborhood;**

**Findings:** If the contractor selects the on-site treatment option, the thermal desorption unit will operate 24 hours a day. All other work activities, such as excavation, backfilling, and associated activities will take place during regular business hours. In all cases, the contractor will meet the noise standards and limitations set forth in Code Section 18.10.060. Because surrounding land uses are industrial and commercial in nature, and existing residential uses are over ½ mile away, the work activities described above should not cause significant negative impacts on the neighborhood. The project will last for a limited duration (October 2002 to February 2003).

This criterion can be met, with the condition that relevant noise control requirements are met (Title 18 of Portland City Code).

**C. Off-site dust and dirt will be kept to a reasonable minimum;**

**Findings:** As noted in the proposed Erosion Control Plan, measures will be taken to reduce erosion that might occur as a result of remedial activities. Depending on weather conditions, dust is possible. Water will be applied to dampen soil if necessary to control dust. During the course of work, the amount of equipment traffic entering/leaving the contaminated area will be kept to a minimum. For example, trucks or drop boxes will be staged adjacent to the area of contamination. Excavators/loaders will be stationed within the contaminated soil will load the trucks/drop boxes without leaving the contaminated area. All equipment leaving the contaminated area will be decontaminated by dry brushing to remove loose soil. Adjacent roadway surfaces with tracked soil will be promptly cleaned. Biofilter bags will be installed around the drainage inlet and geotextile fabric will be installed beneath the grate to ensure that sediment laden water does not enter the drainage system. During the construction period, all erosion control facilities will be inspected daily.

This criterion can be met, with the condition that the applicant obtains a Site Development Permit and complies with relevant Erosion and Sediment Control Regulations (Title 10 of Portland City Code).

- D. The final contours and surface condition of the site will not preclude future development for uses allowed in the base zone; and**

**Findings:** The excavation will be limited to 12 areas, totaling approximately 70,601 square feet.

If the contractor chooses the off-site disposal option, excavated areas will be backfilled only as needed to maintain slope stability, using clean fill from elsewhere on the site and/or from a stockpile of clean soil located in the Rivergate Industrial District in North Portland. In this scenario, the excavated holes (3 to 15 feet deep) would remain on the site until future development proceeds.

If the contractor chooses the on-site treatment option (using thermal desorption technology) the excavated areas will be backfilled using clean and treated soil from the site. Backfilled holes will be moistened or aerated to achieve the desired compaction using mechanical means.

The City is currently reviewing a separate land use review application submitted by Riverscape LLC to carry out mass grading in preparation for development of medium to high density residential and mixed use development on the site, in conformance with the RX zoning designation. The proposed soil remediation work is necessary before further site development can occur. The eventual development of the site will involve substantial re-grading, foundation excavation, street and utility construction, and soil stabilization work. Given the scale of anticipated development, the proposed excavations will not present a significant obstacle to future development.

This criterion is met.

- E. Disruptions to the natural drainage pattern will be mitigated, and will not result in mud or sediment entering the City's stormwater disposal system, rivers, creeks, sloughs, or other identified waterbodies.**

**Findings:** The site is paved with concrete and asphalt. There is little or no vegetation present. Excavation will be limited to the areas shown on the attached site plan (an area of approximately 70,601 square feet. The excavated areas will be 3 to 15 feet deep, and will be temporary because substantial redevelopment of the site is planned after soil remediation work is complete. As such, there will be no significant disruption of natural drainage patterns on the site.

The proposed activities are subject to the requirements of the City's Erosion and Sediment Control Manual (per Title 10). Biofilter bags will be installed at storm drain inlets to ensure sediment-laden water does not enter the drainage system.

The applicant has proposed to limit the duration of work within the greenway setback area to a single day. This proposal helps ensure that work near the river banks will be limited. Silt fencing will be located between the river and Remediation Areas 1 and 2.

This criterion can met, with the condition that the applicant obtains a Site Development Permit and complies with relevant Erosion and Sediment Control Regulations (Title 10 of Portland City Code).

#### **DEVELOPMENT STANDARDS**

Unless specifically required in the approval criteria listed above, this proposal does not have to meet the development standards in order to be approved during this review process. The plans submitted for a building or zoning permit must demonstrate that all development standards of Title 33 can be met, or have received an Adjustment or Modification via a land use review prior to the approval of a building or zoning permit.

## CONCLUSIONS

The proposal is to excavate and treat contaminated soil. The contractors will backfill the excavation areas as needed to maintain stability using clean on-site soils. No new structures or buildings are proposed with this application. Excavation will be limited to the areas shown on the attached site plan (an area of approximately 70,601 square feet. The excavated areas will be 3 to 15 feet deep, and will be temporary because substantial redevelopment of the site is planned after soil remediation work is complete. Contaminated soil will be either removed from the site, or treated on site using a thermal desorption method.

A separate redevelopment proposal was the subject of a recent Subdivision and Greenway Review to establish a framework for future redevelopment of this site (LUR 01-00618). Permits have already been issued for the demolition of existing buildings on the site. In addition, a Greenway Review has been approved for demolition of the large wharf on the river-facing edge of the site. Greenway review is also currently underway to consider a grading permit request submitted by Riverscape LLC. Additional mass site grading is anticipated after contaminated soils are removed.

As described in this report, the proposed activity meets the applicable Greenway Review and Excavation/Fill Review approval criteria. Many of the approval criteria and guidelines are not applicable, because removal/replacement of contaminated soil is the only activity proposed with this review. Approval of this land use review is therefore appropriate. Conditions of approval require that the applicant obtain necessary City permits and comply with relevant sections of the Erosion and Sediment Control Code, and Noise Control Codes applicable to construction activities (Titles 10 and 18). In addition, the applicant must ensure that contaminated materials are brought to an appropriate disposal site in accordance with local, state, and federal requirements (unless they are treated on site and determined by DEQ to be clean).

The landscaping requirements of 33.440.230 will not be applied to the proposed soil remediation project, based on a finding that such landscaping would substantially interfere with the greenway corridor planning process that is underway for this site. This finding is made based on the Willamette Greenway Design Guidelines. Guideline E provides a basis for concluding that planting a single tree and several shrubs on this site at this time would not be meaningful, given that site planning for the expected subdivision is still underway. This issue is discussed in detail on page 8 of this report.

## ADMINISTRATIVE DECISION

**Approval of a Greenway Review and an Excavation/Fill Review to allow removal of approximately 24,964 cubic yards of contaminated soil from a portion of the Terminal One site, and to allow placement of an equivalent amount of fill to backfill the excavated areas as necessary to stabilize slopes. Approved excavation and fills are shown on the attached Exhibits C.2 through C.6, signed and dated September 19, 2002.**

The landscaping requirements of 33.440.230 shall not apply to the proposed soil remediation project.

Approval is subject to the following conditions:

- A. The applicant must obtain a Site Development Permit. Final erosion control plans must comply with all relevant provisions of Title 10 of Portland City Code (Erosion and Sediment Control Regulations).
- B. Construction activities must be carried out in conformance with Title 18 of Portland City Code (Noise Control).
- C. The applicant is responsible for ensuring that excavated materials are treated in conformance with DEQ requirements, or disposed of in conformance with applicable local,

state, and federal requirements. If contaminated materials are moved to another location within the City of Portland, that receiving site must be zoned to allow disposal/management of such materials, and Excavation/Fill Review may be required in as specified in Title 33.

Staff Planner: Eric Engstrom

Decision rendered by: Susan Feldman on September 19<sup>th</sup>, 2002

Decision filed September 20<sup>th</sup>, 2002;  
24<sup>th</sup>, 2002

Decision mailed September

**This application was determined to be complete on August 27<sup>th</sup>, 2002.**

**Note:** some of the information contained in this report was provided by the applicant. As required by Section 33.800.060 of the Portland Zoning Code, the burden of proof is on the applicant to show that the approval criteria are met. The Office of Planning and Development Review has independently reviewed the information submitted by the applicant and has included this information only where the Office of Planning and Development Review has determined the information satisfactorily demonstrates compliance with the applicable approval criteria. This report is the decision of the Office of Planning and Development Review with input from other City and public agencies.

**Appealing this decision.** This decision may be appealed to the Hearings Officer, which will hold a public hearing. Appeals must be filed by 4:30 PM on October 8<sup>th</sup>, 2002 at 1900 SW Fourth Ave. Appeals can be filed on the first floor in the Development Services Center until 3 p.m. After 3 p.m., appeals must be submitted to the receptionist at the front desk on the fourth floor. **An appeal fee of \$250 will be charged.** The appeal fee will be refunded if the appellant prevails. Recognized neighborhood associations and low-income individuals appealing a decision for their personal residence may qualify for an appeal fee waiver. Assistance in filing the appeal and information on fee waivers is available from OPDR in the Development Services Center. Fee waivers for low-income individuals must be approved prior to filing your appeal; please allow 3 working days for fee waiver approval. Fee waivers for neighborhood associations require a vote of the authorized body of your association. Please see the appeal form for additional information.

The file and all evidence on this case are available for your review by appointment only. Please contact the receptionist at 503-823-7967 to schedule an appointment. I can provide some information over the phone. Copies of all information in the file can be obtained for a fee equal to the cost of services. Additional information about the City of Portland, city bureaus, and a digital copy of the Portland Zoning Code is available on the internet at [www.ci.portland.or.us](http://www.ci.portland.or.us).

**Attending the hearing.** If this decision is appealed, a hearing will be scheduled, and you will be notified of the date and time of the hearing. The decision of the Hearings Officer is final; any further appeal must be made to the Oregon Land Use Board of Appeals (LUBA) within 21 days of the date of mailing the decision, pursuant to ORS 197.620 and 197.830. Contact LUBA at 550 Capitol St. NE, Salem, Oregon 97310 or phone 1-503-373-1265 for further information.

Failure to raise an issue by the close of the record at or following the final hearing on this case, in person or by letter, may preclude an appeal to the Land Use Board of Appeals (LUBA) on that issue. Also, if you do not raise an issue with enough specificity to give the Hearings Officer an opportunity to respond to it, that also may preclude an appeal to LUBA on that issue.

**Recording the final decision.** Before you proceed with your project, you are required to record the final Land Use Review decision with the Multnomah County Recorder. A building or zoning permit will be issued only after the final decision is recorded. The final decision may be recorded on or after October 9<sup>th</sup>, 2002 - the day following the last day to appeal.

The applicant, builder, or a representative may record the final decision as follows:

- **By Mail:** Send the two recording sheets (sent in separate mailing) and the final Land Use Review decision with a check made payable to the Multnomah County Recorder to: Multnomah County Recorder, P.O. Box 5007, Portland OR 97208. The recording fee is identified on the recording sheet. Please include a self-addressed, stamped envelope.
- **In Person:** Bring the two recording sheets (sent in separate mailing) and the final Land Use Review decision with a check made payable to the Multnomah County Recorder to the County Recorder's office located at 501 SE Hawthorne Boulevard, #158, Portland OR 97214. The recording fee is identified on the recording sheet.

For further information on recording, please call the County Recorder at 503-988-3034.

**Expiration of this approval.** This decision expires three years from the date the final decision is rendered unless:

- A building permit has been issued, or
- The approved activity has begun, or
- In situations involving only the creation of lots, the land division has been recorded.

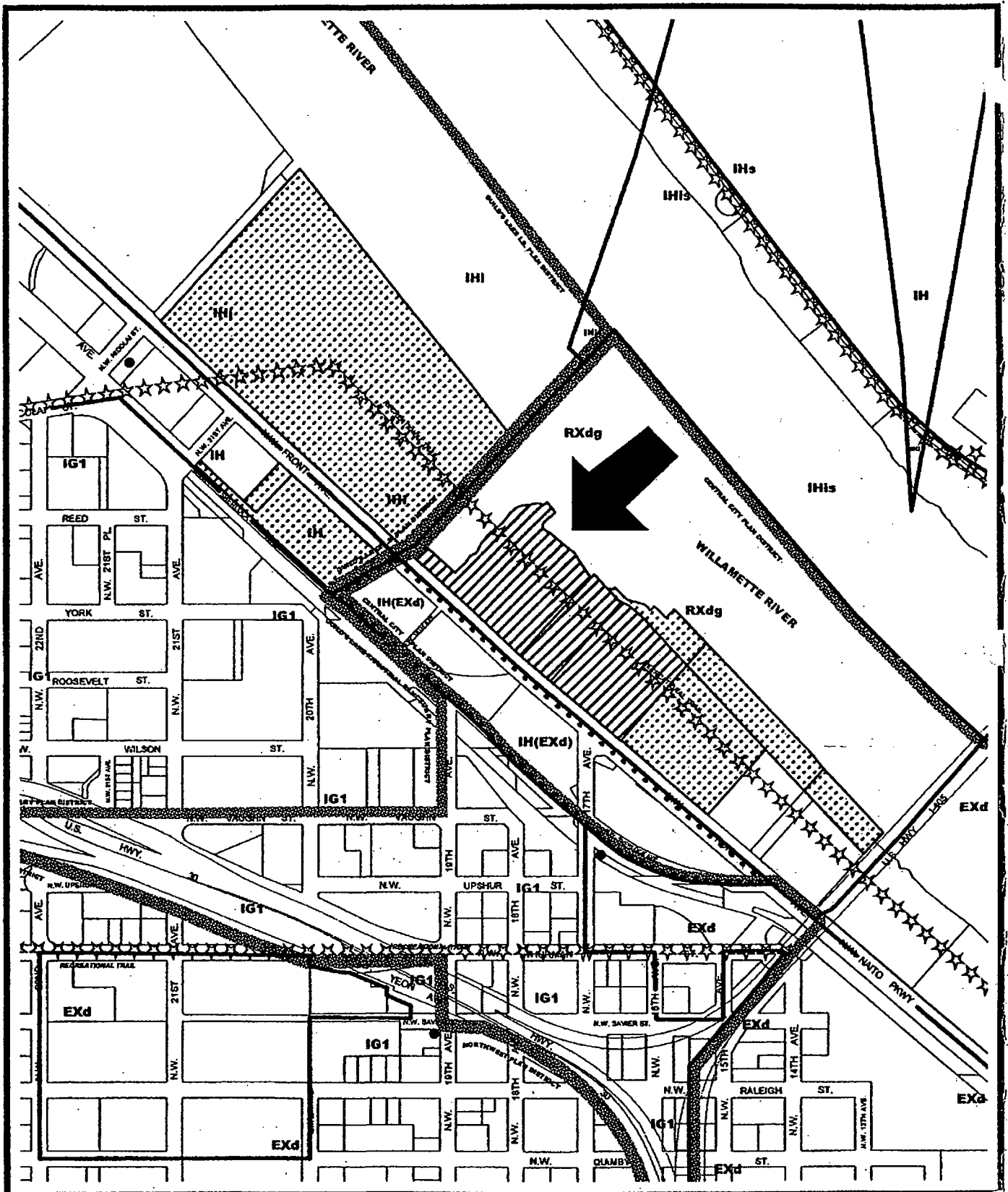
**Applying for your permits.** A building permit, occupancy permit, or development permit must be obtained before carrying out this project. At the time they apply for a permit, permittees must demonstrate compliance with:

- All conditions imposed here.
- All applicable development standards, unless specifically exempted as part of this land use review.
- All requirements of the building code.
- All provisions of the Municipal Code of the City of Portland, and all other applicable ordinances, provisions and regulations of the City.

**EXHIBITS**  
**NOT ATTACHED UNLESS INDICATED**

- A. Applicant's Statements
  - 1. Application Narrative, dated August 12, 2002
  - 2. DRAFT Removal Action Work Plan (Attachment A1), dated March 7, 2002
  - 3. DEQ Staff Report on Recommended Remedial Action ESCI File No 2642 (Attachment A2), dated July 15, 2002
- B. Zoning Map (attached)
- C. Plans/Drawings:
  - 1. Area A Project Site Plan
  - 2. Excavation and Fill Plan (attached)
  - 3. Erosion Control Plan
  - 4. Demolition Plan
  - 5. Excavation Details
  - 6. Shoring Details
- D. Notification information:
  - 1. Mailing list
  - 2. Mailed notice
- E. Agency Responses:
  - 1. Bureau of Environmental Services
  - 2. Bureau of Transportation Engineering and Development Review
  - 3. Fire Bureau
  - 4. Site Development Review Section of OPDR
- F. Correspondence (none received)
- G. Other:
  - 1. Original LU Application
  - 2. Site History Research
  - 3. Taxdot Information
  - 4. A Citizen's Guide to Thermal Desorption, EPA, dated April 1996
  - 5. Removal Action Work Plan, Hart Crowser, dated March 26<sup>th</sup>, 2002

**The Office of Planning and Development Review is committed to providing equal access to information and hearings. If you need special accommodations, please call 503-823-7967 (TTY 503-823-6868).**



**ZONING**

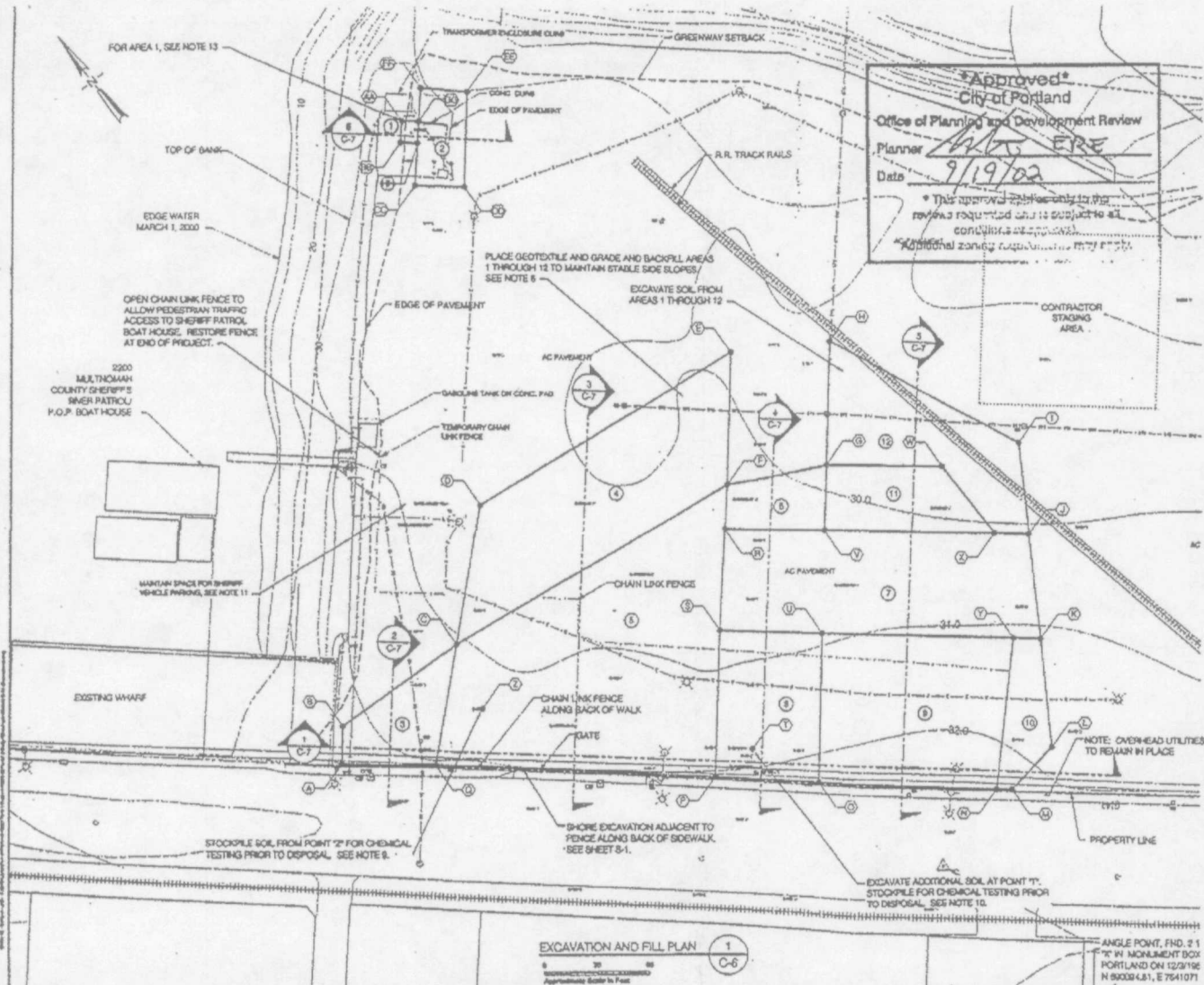
-  Site
-  Property also owned
-  Historic Landmark

This site lies within the:  
CENTRAL CITY PLAN DISTRICT



File No.	LU 02-135500 GW EF
1/4 Section	2828
Scale	1 inch = 500 feet
State-Id	1N1E28DB -00100+
Exhibit	B (Sep 19, 2002)

POPT1S602523



- NOTES:
1. EXCAVATE SOIL FROM THE AREAS AND TO THE ELEVATIONS SHOWN.
  2. CONTRACTOR SHALL SLOPE OR SHORE EXCAVATIONS AS INDICATED ON THE DETAILS ON SHEET C-7. ALL WORK SHALL BE IN ACCORDANCE WITH OSHA REGULATIONS.
  3. NOMINAL AREAS, DEPTHS, AND VOLUMES FOR NEAT LINE DIMENSIONS ARE PROVIDED IN THE SCHEDULE BELOW. EXCAVATION VOLUMES REQUIRED FOR CONTRACTOR DETERMINED SLOPES ARE NOT INCLUDED IN THE SCHEDULE BELOW.
  4. "CLEAN OVERBURDEN" SHALL BE STOCKPILED AT A LOCATION DETERMINED BY CONTRACTOR. "CLEAN OVERBURDEN" SHALL BE USED TO BACKFILL EXCAVATIONS.
  5. "CONTAMINATED SOIL" SHALL BE REMOVED FROM THE SITE FOR TREATMENT OR DISPOSAL AT A PERMITTED FACILITY. ALTERNATELY, "CONTAMINATED SOIL" MAY BE TREATED ON-SITE. HAZARDOUS WASTE SHALL BE REMOVED FROM THE SITE FOR DISPOSAL AT A PERMITTED FACILITY.
  6. FOLLOWING RECEIPT OF PORTS CONFIRMATION SAMPLE RESULTS AND PRIOR TO BACKFILLING, PLACE GEOTEXTILE ON EXCAVATION WALLS AND FLOOR. FOR ON-SITE TREATMENT OPTION ONLY, BACKFILL WITH "CLEAN OVERBURDEN" AND TREATED SOIL TO EXISTING GRADE IN ACCORDANCE WITH DETAIL T-27 (NO IMPORTED FILL REQUIRED FOR BACKFILL). FOR OFF-SITE DISPOSAL OR TREATMENT OPTION, BACKFILL WITH "CLEAN OVERBURDEN" AND PORT "BONFAY" IN ACCORDANCE WITH DETAILS MC-7, S-C-7, AND 18C-7 TO MAINTAIN STABLE SIDE SLOPES.
  7. UTILITIES SHOWN ARE BASED ON DESIGN DRAWINGS AND SURVEY OF VISIBLE PHYSICAL FEATURES AND LOCATE MARKINGS. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES.
  8. PORT WILL IDENTIFY UTILITY SHUTOFFS TO CONTRACTOR.
  9. AT POINT "Z", SOIL WITHIN 10-FOOT RADIUS ABOUT POINT "Z" FROM DEPTH 0 TO 3 FEET SHALL BE STOCKPILED SEPARATELY AS POTENTIAL HAZARDOUS WASTE. BASED ON TESTING BY PORT, THE MATERIAL WILL BE DESIGNATED AS CONTAMINATED SOIL OR HAZARDOUS WASTE.
  10. AT POINT "T", EXCAVATE SOIL IN 10-FOOT RADIUS ABOUT POINT "T" FROM DEPTH 5 TO 10 FEET. STOCKPILE SEPARATELY AS POTENTIAL HAZARDOUS WASTE. BASED ON TESTING BY PORT, THE MATERIAL WILL BE DESIGNATED AS CONTAMINATED SOIL OR HAZARDOUS WASTE.
  11. CONTRACTOR SHALL MAINTAIN ACCESS AT ALL TIMES FOR SHERIFF VEHICLES THROUGH SOUTH ACCESS GATE TO PARKING AREA INDICATED.
  12. INFORMATION FOR CITY OF PORTLAND REVIEW: THE TOTAL CUT BELOW ELEVATION 28.4 FEET (100-YEAR FLOOD PLANE) IS 21,000 CUBIC YARDS (NEAT LINE). TOTAL FILL BELOW 28.4 FEET IS 9,000 CUBIC YARDS (NET CUT OF 12,000 CUBIC YARDS) FOR OFF-SITE DISPOSAL, OPTION, OR 21,000 CUBIC YARDS (NET CUT/FILL OF 22ND CUBIC YARDS) FOR THE ON-SITE TREATMENT OPTION.
  13. ALL WORK (INCLUDING DEMOLITION, EXCAVATION, AND BACKFILLING) IN AREA 1 SHALL BE COMPLETED IN ONE BUSINESS DAY.

SCHEDULE OF EXCAVATION AREAS, DEPTHS, AND VOLUMES:

AREA	AREA (SQ. FEET)	EXCAVATION DEPTH (FEET)	CLEAN OVERBURDEN VOLUME (CUBIC YARDS)	CONTAMINATED SOIL VOLUME (CUBIC YARDS)
1	11.0	3	0	13
2	1.0	3	0	3
3	2.3	3	0	3
4	15.0	11	0	2,000
5	11.0	11	0	1,500
6	1.0	3	0	3
7	15.0	3	0	1,119
8	1.0	3	0	3
9	1.0	3	0	3
10	1.0	3	0	3
11	1.0	3	0	3
12	1.0	3	0	3
13	1.0	3	0	3
14	1.0	3	0	3
15	1.0	3	0	3
16	1.0	3	0	3
17	1.0	3	0	3
18	1.0	3	0	3
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22	1.0	3	0	3
23	1.0	3	0	3
24	1.0	3	0	3
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26	1.0	3	0	3
27	1.0	3	0	3
28	1.0	3	0	3
29	1.0	3	0	3
30	1.0	3	0	3
31	1.0	3	0	3
32	1.0	3	0	3
33	1.0	3	0	3
34	1.0	3	0	3
35	1.0	3	0	3
36	1.0	3	0	3
37	1.0	3	0	3
38	1.0	3	0	3
39	1.0	3	0	3
40	1.0	3	0	3
41	1.0	3	0	3
42	1.0	3	0	3
43	1.0	3	0	3
44	1.0	3	0	3
45	1.0	3	0	3
46	1.0	3	0	3
47	1.0	3	0	3
48	1.0	3	0	3
49	1.0	3	0	3
50	1.0	3	0	3
51	1.0	3	0	3
52	1.0	3	0	3
53	1.0	3	0	3
54	1.0	3	0	3
55	1.0	3	0	3
56	1.0	3	0	3
57	1.0	3	0	3
58	1.0	3	0	3
59	1.0	3	0	3
60	1.0	3	0	3
61	1.0	3	0	3
62	1.0	3	0	3
63	1.0	3	0	3
64	1.0	3	0	3
65	1.0	3	0	3
66	1.0	3	0	3
67	1.0	3	0	3
68	1.0	3	0	3
69	1.0	3	0	3
70	1.0	3	0	3
71	1.0	3	0	3
72	1.0	3	0	3
73	1.0	3	0	3
74	1.0	3	0	3
75	1.0	3	0	3
76	1.0	3	0	3
77	1.0	3	0	3
78	1.0	3	0	3
79	1.0	3	0	3
80	1.0	3	0	3
81	1.0	3	0	3
82	1.0	3	0	3
83	1.0	3	0	3
84	1.0	3	0	3
85	1.0	3	0	3
86	1.0	3	0	3
87	1.0	3	0	3
88	1.0	3	0	3
89	1.0	3	0	3
90	1.0	3	0	3
91	1.0	3	0	3
92	1.0	3	0	3
93	1.0	3	0	3
94	1.0	3	0	3
95	1.0	3	0	3
96	1.0	3	0	3
97	1.0	3	0	3
98	1.0	3	0	3
99	1.0	3	0	3
100	1.0	3	0	3

EXCAVATION COORDINATES

POINT	NORTHING	EASTING	EXISTING ELEV.	BOTTOM EXCAVATION ELEV.	POINT	NORTHING	EASTING	EXISTING ELEV.	BOTTOM EXCAVATION ELEV.
A	880071	761063	25.1	22.9	X	880127	761109	30.7	28.5
B	880072	761064	25.2	23.0	Y	880128	761110	30.8	28.6
C	880073	761065	25.3	23.1	Z	880129	761111	30.9	28.7
D	880074	761066	25.4	23.2	AA	880130	761112	31.0	28.8
E	880075	761067	25.5	23.3	AB	880131	761113	31.1	28.9
F	880076	761068	25.6	23.4	AC	880132	761114	31.2	29.0
G	880077	761069	25.7	23.5	AD	880133	761115	31.3	29.1
H	880078	761070	25.8	23.6	AE	880134	761116	31.4	29.2
I	880079	761071	25.9	23.7	AF	880135	761117	31.5	29.3
J	880080	761072	26.0	23.8	AG	880136	761118	31.6	29.4
K	880081	761073	26.1	23.9	AH	880137	761119	31.7	29.5
L	880082	761074	26.2	24.0	AI	880138	761120	31.8	29.6
M	880083	761075	26.3	24.1	AJ	880139	761121	31.9	29.7
N	880084	761076	26.4	24.2	AK	880140	761122	32.0	29.8
O	880085	761077	26.5	24.3	AL	880141	761123	32.1	29.9
P	880086	761078	26.6	24.4	AM	880142	761124	32.2	30.0
Q	880087	761079	26.7	24.5	AN	880143	761125	32.3	30.1
R	880088	761080	26.8	24.6	AO	880144	761126	32.4	30.2
S	880089	761081	26.9	24.7	AP	880145	761127	32.5	30.3
T	880090	761082	27.0	24.8	AQ	880146	761128	32.6	30.4
U	880091	761083	27.1	24.9	AR	880147	761129	32.7	30.5
V	880092	761084	27.2	25.0	AS	880148	761130	32.8	30.6
W	880093	761085	27.3	25.1	AT	880149	761131	32.9	30.7
X	880094	761086	27.4	25.2	AV	880150	761132	33.0	30.8
Y	880095	761087	27.5	25.3	AW	880151	761133	33.1	30.9
Z	880096	761088	27.6	25.4	AX	880152	761134	33.2	31.0
AA	880097	761089	27.7	25.5	AY	880153	761135	33.3	31.1
AB	880098	761090	27.8	25.6	AZ	880154	761136	33.4	31.2
AC	880099	761091	27.9	25.7	BA	880155	761137	33.5	31.3
AD	880100	761092	28.0	25.8	BB	880156	761138	33.6	31.4
AE	880101	761093	28.1	25.9	BC	880157	761139	33.7	31.5
AF	880102	761094	28.2	26.0	BD	880158	761140	33.8	31.6
AG	880103	761095	28.3	26.1	BE	880159	761141	33.9	31.7
AH	880104	761096	28.4	26.2	BF	880160	761142	34.0	31.8
AI	880105	761097	28.5	26.3	BG	880161	761143	34.1	31.9
AJ	880106	761098	28.6	26.4	BH	880162	761144	34.2	32.0
AK	880107	761099	28.7	26.5	BI	880163	761145	34.3	32.1
AL	880108	761100	28.8	26.6	BJ	880164	761146	34.4	32.2
AM	880109	761101	28.9	26.7	BK	880165	761147	34.5	32.3
AN	880110	761102	29.0	26.8	BL	880166	761148	34.6	32.4
AO	880111	761103	29.1	26.9	BM	880167	761149	34.7	32.5
AP	880112	761104	29.2	27.0	BN	880168	761150	34.8	32.6
AQ	880113	761105	29.3	27.1	BO	880169	761151	34.9	32.7
AR	880114	761106	29.4	27.2	BP	880170	761152	35.0	32.8
AS	880115	761107	29.5	27.3	BQ	880171	761153	35.1	32.9
AT	880116	761108	29.6	27.4	BR	880172	761154	35.2	33.0
AU	880117	761109	29.7	27.5	BS	880173	761155	35.3	33.1
AV	880118	761110	29.8	27.6	BT	880174	761156	35.4	33.2
AW	880119	761111	29.9	27.7	BU	880175	761157	35.5	33.3
AX	880120	761112	30.0	27.8	BV	880176	761158	35.6	33.4
AY	880121	761113	30.1	27.9	BW	880177	761159	35.7	33.5
AZ	880122	761114	30.2	28.0	BX	880178	761160	35.8	33.6
BA	880123	761115	30.3	28.1	BY	880179	761161	35.9	33.7
BB	880124	761116	30.4	28.2	BZ	880180	761162	36.0	33.8
BC	880125	761117	30.5	28.3	CA	880181	761163	36.1	33.9
BD	880126	761118	30.6	28.4	CB	880182	761164	36.2	34.0
BE	880127	761119	30.7	28.5	CC	880183	761165	36.3	34.1
BF	880128	761120	30.8	28.6	CD	880184	761166	36.4	34.2
BG	880129	761121	30.9	28.7	CE	880185	761167	36.5	34.3
BH	880130	761122	31.0	28.8	CF	880186	761168	36.6	34.4
BI	880131	761123	31.1	28.9	CG	880187	761169	36.7	34.5
BJ	880132	761124	31.2	29.0	CH	880188	761170	36.8	34.6
BK	880133	761125	31.3	29.1	CI	880189	761171	36.9	34.7
BL	880134	761126	31.4	29.2	CJ	880190	761172	37.0	34.8
BM	880135	761127	31.5	29.3	CK	880191	761173	37.1	34.9
BN	880136	761128	31.6	29.4	CL	880192	761174	37.2	35.0
BO	880137	761129	31.7	29.5	CM	880193	761175	37.3	35.1
BP	880138	761130	31.8	29.6	CN	880194	761176	37.4	35.2
BQ	880139	761131	31.9	29.7	CO	880195	761177	37.5	35.3
BR	880140	761132	32.0	29.8	CP	880196	761178	37.6	35.4
					CQ	880197	761179	37.7	35.5

# Carlson Testing, Inc.

**Main Office**  
P.O. Box 23814  
Tigard, Oregon 97281  
Phone (503) 684-3460  
FAX (503) 684-0954

**Salem Office**  
4060 Hudson Ave., NE  
Salem, OR 97301  
Phone (503) 589-1252  
FAX (503) 589-1309

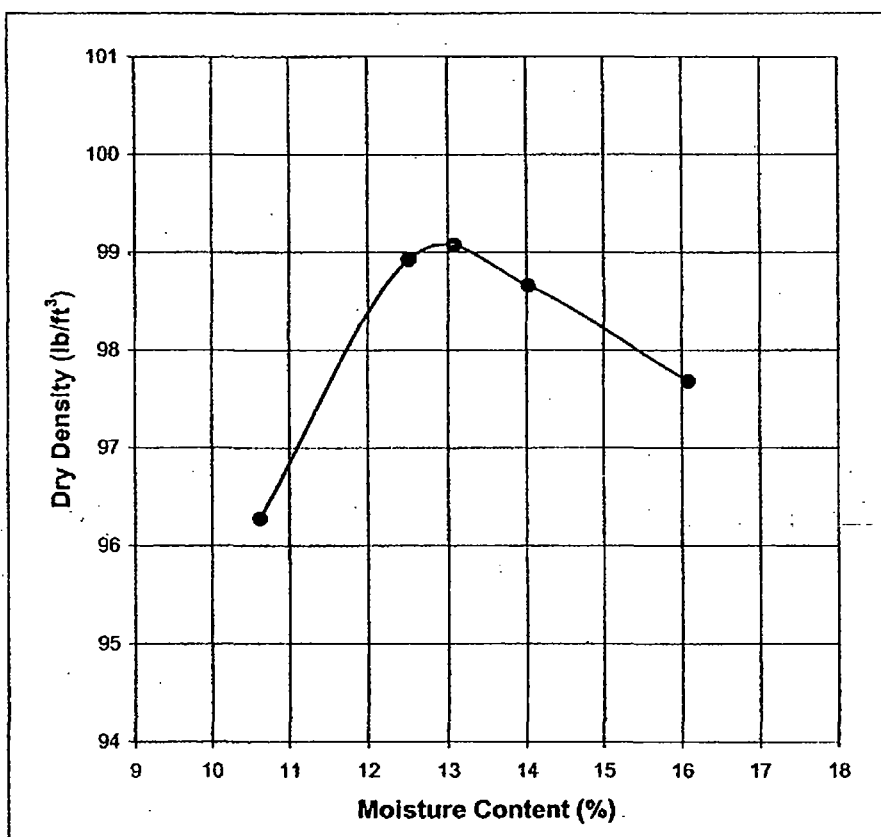
**Bend Office**  
P.O. Box 7918  
Bend, OR 97708  
Phone (541) 330-9155  
FAX (541) 330-9163

## Moisture - Density Relationship

**Client:** Hart Crowser - Levi Fernandes  
**Project:** Terminal 1 South  
**Material Type:** Dredge Sand

**Job Number:** 8/27/02  
T0201376  
**Location:** Off- Site Dredge Stockpile #2

<b>Test Method:</b>	ASTM D-1557 B, C-136, D-2216	<b>Date Sampled:</b>	08/09/02
<b>Sample Method:</b>	ASTM D-75	<b>Date Tested:</b>	08/14/02
<b>Preparation Method:</b>	Moist	<b>Oversized Material:</b>	Removed
<b>Compacting Method:</b>	Manual	<b>Hammer Type:</b>	Circular



HART CROWSER, INC

AUG 30 2002

Portland Office

Zero Air Voids Line = 2.600

<b>Optimum Moisture:</b>	<b>13.1%</b>	<b>Max. Dry Density:</b>	<b>99.1</b> lbs/ft³
<b>Percent Passing 3/8" Sieve:</b>	<b>100.0%</b>		

cc:

Reviewed By: 

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POPT1S602525

# Carlson Testing, Inc.

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FAX (503) 589-1309

**Bend Office**  
P.O. Box 7918  
Bend, OR 97708  
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FAX (541) 330-9163

## Moisture - Density Relationship

**Client:** Hart Crowser

**Project:** Port of Portland T1 Parcel 3 (Job #15230-05)

**Material Type:** Sand Fill

01/20/03

**Job Number:**

T0302299

**Location:**

On-Site (Stockpile)

**Test Method:** ASTM D-1557 A, C-136, D-2216

**Date Sampled:** 01/03/03

**Sample Method:** ASTM D-75

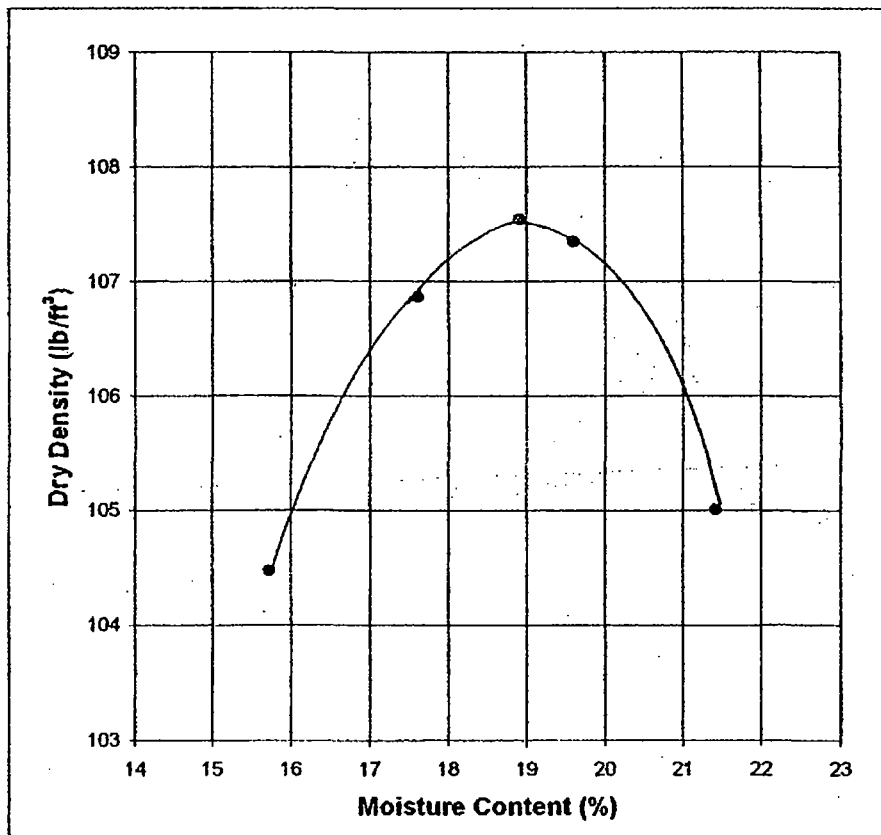
**Date Tested:** 01/07/03

**Preparation Method:** Moist

**Oversized Material:** Removed

**Compacting Method:** Manual

**Hammer Type:** Circular



HART CROWSER, JR

JAN 27 2003

Portland Office

Coarse specific gravity used in adjusted max density computations: 2.424  
Optimum Moisture: 18.9% Max. Dry Density: 107.5 lbs/ft³  
Adjusted Opt Moisture: 17.8% Adjusted Max Density: 113.5  
Percent Passing 3/4" Sieve: 81.9%

cc:

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POPT1S602526

## Earth and Environmental Technologies

15230-05

Page: 2 of 2

Project Name DOT-T-1 Ph. 2	Client or Owner DOT	Permit Number
-------------------------------	------------------------	---------------

General Location of Work <b>Portland, ORE.</b>	Owner or Client's Representative <b>Frank Schmidt</b>	Date <b>1/14/03</b>	Day of Week <b>Tues</b>
General Contractor <b>Wilder Construction</b>	Grading Contractor <b>Same</b>	Project Engineer <b>Herb Clough</b>	
Type of Work <b>Grading / Backfill</b>	Grading Contractor's Superintendent or Foreman <b>Mike</b>	Supervisor	
Source and Description of Fill Material <b>Sand from Rivergate (T-6)</b>	Weather <b>Sunny</b>	Technician <b>Frank Sherryfield</b>	
		Key Persons Contacted (Civil Engr. Architect, Developer, etc.)	

Field Testing									
Test #	Test Location	Elevation	Dry Density lbs/cu.ft.	Moisture Content %	% of Maximum Dry Density	Comp Curve No.	Maximum Dry Density lbs/cu.ft.	Optimum	Comments
1	Slope area 10/11	⊕	81.6	14.8	82.4		99.1	13.1	Spec. 90%
2	" " "	⊕	85.2	13.2	86.1		↓	↓	
3	" " "	⊕	82.2	12.9	83.0				
← RETESTS →									
4	Slope area 10/11	⊕	88.4	12.1	89.2				Retests
5	" " 10/11	⊕	89.2	11.8	90.1				"
6	" " 10/11	⊕	86.9	10.2	87.7				"

**Notes (Describe work completed during the day, any problems and their solution)**

[illegible]

Report by

by Ford H. Shorefield

Form #: ILC Geo.02 (10/99)

POPT1S602527

# HART CROWSER

Earth and Environmental Technologies

Job #:

15230-05

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## DAILY FIELD REPORT

Project Name POP-T1 Parcel 3	Client or Owner POP	Permit Number
---------------------------------	------------------------	---------------

General Location of Work Portland, Oregon	Owner or Client's Representative Frank Schmidt	Date 1/15/03	Day of Week Wed
General Contractor Wilder	Grading Contractor Wilder	Project Engineer Herb Clough	
Type of Work Grading / Backfill / Compaction	Grading Contractor's Superintendent or Foreman Mike Fey	Supervisor	
Source and Description of Fill Material Sara Dredge from Port Barrow Site	Weather Overcast	Technician Levi Fernandez	
On-site Fill gravelly Sand	Key Persons Contacted (Civil Engr. Architect, Developer, etc.) Nuclear Density Meter		

Field Testing									
Test #	Test Location	Elevation	Dry Density lbs/cu.ft.	Moisture Content %	% of Maximum Dry Density	Comp Curve No.	Maximum Dry Density lbs/cu.ft.	Optimum	Comments
1	Area 4 and 5 Sideslope	2	91.3	7.85	92.1		99.1	13.1%	
2	"	2	92.2	7.62	93.0				
3	"	2	90.3	7.19	91.1				
4	"	2	93.2	7.90	94.1				
5	"	4	95.6	6.92	96.5				
6	"	4	91.9	6.73	92.7				
7	"	4	92.1	6.77	92.9				
8	"	4	98.5	7.72	99.4				
9	"	6	98.1	7.31	98.9				
10	"	6	91.7	6.27	92.5				
11	"	6	90.5	6.85	91.3				
12	"	6	90.7	6.43	91.5				

Describe Equipment used for Hauling, Spreading, Watering, Conditioning and Compacting  
06 Dozer, 12 Smooth-Drum Vibratory Compactor, no water applied.

Notes (Describe work completed during the day, any problems and their solution)

Dredge Sand Barrow 99.1, 13.1% → Mod. Proctor (Carlson)

On-site Fill 113, 15.6%

① Backfill / Compact in Areas 4 and 5 (sideslopes) 2:1 → 3 lifts @ 2' per lift (Bottom Dredge Sand)

② Backfill / Compact in Area 9 (along shoring) → 2 lifts @ 2' per lift (onsite fill)

③ Backfill / Compact in Area 11 and 12 (sideslopes) → tamp with truck hoe bucket, irregular excavation shape does not allow for compactor access.

④ Backfill / Compacting in Area 3 (sideslopes) around 2" PVC pipe). Hand tamp around pipe.

★ Moisture low → need to check gauge with Frank Schenckfeld

Five Centerpointe Drive, Suite 240  
Lake Oswego, Oregon 97035  
Fax 503.620.6918  
Tel 503.620.7284

Report by

Form #: HC Geo.02 (10/99)

POPT1S602528

## Earth and Environmental Technologies

Page: 2 of 2

Project Name	Client or Owner	Permit Number
DDP - TI Parcel 3	DDP	

General Location of Work Portland Oregon		Owner or Client's Representative Frank Schmidt		Date 11/15/03	Day of Week Weds
General Contractor Wilder		Grading Contractor Wilder		Project Engineer Herb Clough	
Type of Work Grading / Backfill / Compaction		Grading Contractor's Superintendent or Foreman Mike Peg		Supervisor	
Source and Description of Fill Material Sand Dredge from Port Borrow Site			Weather Overcast		Technician Levi Fernandez
			Key Persons Contacted (Civil Engr. Architect, Developer, etc.) Nuclear Densitometer		

[illegible]

**Describe Equipment used for Hauling, Spreading, Watering, Conditioning and Compacting**

06 Dose, IR Smooth - Dmr Vibratory Compactor, no water applied.

**Notes** (Describe work completed during the day, any problems and their solution)

See Notes page 1

\* Compaction 70-100 on sideslopes (tamping with truck hoe bucket)  
Varies depending on placement of densometer within bucket tamping area.

**Five Centerpointe Drive, Suite 240  
Lake Oswego, Oregon 97035  
Fax 503.620.6918  
Tel 503.620.7284**

Report by

Form #: HC Geo.02 (10/99)

POPT1S602529

## Earth and Environmental Technologies

Page: 1 of 1

Project Name	Client or Owner	Permit Number
POP - T1 Parcel 3	POP	

General Location of Work Portland, Oregon		Owner or Client's Representative Frank Schriat		Date 11/16/03	Day of Week Thursday
General Contractor Wilder		Grading Contractor Wilder		Project Engineer Herb Clough	
Type of Work Grading / Backfill / Compaction		Grading Contractor's Superintendent or Foreman Mike Fey		Supervisor	
Source and Description of Fill Material Sand Dredge from Port Barrow Site			Weather Overcast		Technician Levi Fernandez
			Key Persons Contacted (Civil Engr. Architect, Developer, etc.) Nuclear Decommissioning		

[illegible]

06 Dozer, IR Smooth-Drum Vibratory Compactor, no water applied.

Oredye Sand Borrow 99.1, 13.1% — Max. Proctor (Carlson)

① Backfill/Compact along shoring in Area 5. "Dump" area located in Area 3 and north section of Area. "Dump" area being built up. Compacted by tamping with bucket.

Front Schenefeld take over

**Report by**

Form #: HC Geo.02 (10/99)

POPT1S602530

# HART CROWSER

Earth and Environmental Technologies

Job #:

15230-05

Page: 2 of 3

## DAILY FIELD REPORT

Project Name T-1 AREA 3	Client or Owner POP	Permit Number
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General Location of Work Portland, ORE	Owner or Client's Representative Joanne Schmidt	Date 1/16/03	Day of Week thurs
General Contractor Wildor Const	Grading Contractor Same	Project Engineer Herb Clough	
Type of Work Grading / BACKFILL	Grading Contractor's Superintendent or Foreman Mike	Supervisor	
Source and Description of Fill Material Imported Clean Sand from Rivergate T-6	Weather Partly Sunny	Technician Frank Sharfield	Key Persons Contacted (Civil Engr, Architect, Developer, etc.)

Test #	Test Location	Elevation	Field Testing			Comp Curve No.	Maximum Dry Density Lbs/cu.ft.	Optimum	Comments
			Dry Density lbs/cu.ft.	Moisture Content %	% of Maximum Dry Density				
1	Area 9 pile 7	-5'	91.2	8.8	92.1		99.1	13.1%	Spec 90%
2	" " " 11	-7'	90.9	8.9	91.8				
3	" " " 15	-8'	90.3	8.4	91.2				
4	Area 8 pile 27	-10'	90.7	9.0	91.6				
5	Area 5 pile 32	-12'	89.1	7.8	89.9				
6	" " " 38	-12'	90.2	8.7	91.1				
7	Area 9 pile 6	-3'	91.5	9.4	92.4				
8	" 9 " 12	-5'	89.7	7.9	90.6				
9	" 9 " 16	-7'	90.9	8.8	91.8				
10	" 9 pile 6	-1'	91.0	8.6	91.9				
11	9 " 11	-3'	90.0	7.7	90.9				
12	9 " 15	-5'	90.5	8.8	91.4				

Describe Equipment used for Hauling, Spreading, Watering, Conditioning and Compacting

Notes (Describe work completed during the day, any problems and their solution)

Tests were taken at random sites chosen by myself. All tests showed adequate compaction and results meet or exceed project specifications. Contractor will continue importing and placing/compacting sand tomorrow and I will be on site to observe and test progress of Contractor work.

Five Centerpointe Drive, Suite 240  
Lake Oswego, Oregon 97035  
Fax 503.620.6918  
Tel 503.620.7284

Report by

Frank H. Sharfield

Form #: HIC Geo.02 (10/99)

POPT1S602531

# HART CROWSER

Earth and Environmental Technologies

Job #:

15230-05

Page:

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## DAILY FIELD REPORT

Project Name <b>T-1 AREA 3</b>	Client or Owner <b>POP</b>	Permit Number
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General Location of Work <b>Portland, ORE.</b>	Owner or Client's Representative <b>Frank Schmidt</b>	Date <b>1/16/03</b>	Day of Week <b>Thurs</b>
General Contractor <b>Wilcox Construction</b>	Grading Contractor <b>Same</b>	Project Engineer <b>Herb Clough</b>	
Type of Work <b>Grading/Backfill</b>	Grading Contractor's Superintendent or Foreman <b>Mike</b>	Supervisor	
Source and Description of Fill Material <b>Imported Sand from River Gate T-6</b>		Weather <b>Partly Sunny</b>	Technician <b>Frank Shenefield</b>
		Key Persons Contacted (Civil Engr. Architect, Developer, etc.)	

Field Testing									
Test #	Test Location	Elevation	Dry Density lbs/cu.ft.	Moisture Content %	% of Maximum Dry Density	Comp Curve No.	Maximum Dry Density Lbs./cu.ft.	Optimum	Comments
13	AREA 5 pit 27	-8 <sup>00</sup> '	91.4	8.7	92.3		99.1	13.1%	Spec. 90%
14	" " " 32	-10 <sup>00</sup> '	90.8	9.1	91.7				
15	" " " 38	-10 <sup>00</sup> '	91.3	10.2	92.2				
16	" " " 45	-12 <sup>00</sup> '	89.5	8.6	90.4				
17	" " " 49	-12 <sup>00</sup> '	90.3	7.9	91.2				
18	" " " 56	-12 <sup>00</sup> '	91.5	8.3	92.4				
19	" " " 28	-5 <sup>00</sup> '	89.7	9.0	90.6				
20	" " " 35	-7 <sup>00</sup> '	89.3	8.7	90.2				
21	" " " 45	-10 <sup>00</sup> '	91.1	8.3	92.0				
22	" " " 28	-3 <sup>00</sup> '	90.6	9.2	91.5				
23	" " " 36	-5 <sup>00</sup> '	90.2	8.6	91.1				
24	" " " 52	-7 <sup>00</sup> '	89.7	9.4	90.5				

Describe Equipment used for Hauling, Spreading, Watering, Conditioning and Compacting

Notes (Describe work completed during the day, any problems and their solution)

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Lake Oswego, Oregon 97035  
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Report by

*Frank H. Shenefield*

Form #: HC Geo.02 (10/99)

POPT1S602532

# HART CROWSER

Earth and Environmental Technologies

Job #:

15230-05

Page:

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## DAILY FIELD REPORT

Project Name <b>T-1 AREA 2</b>	Client or Owner <b>POP</b>	Permit Number
-----------------------------------	-------------------------------	---------------

General Location of Work <b>Portland, OR</b>	Owner or Client's Representative <b>Frank Schmitt</b>	Date <b>1/17/03</b>	Day of Week <b>Friday</b>
General Contractor <b>Wildco Construction</b>	Grading Contractor <b>Boone</b>	Project Engineer <b>H. Clough</b>	
Type of Work <b>Grading backfill</b>	Grading Contractor's Superintendent or Foreman <b>Mike</b>	Supervisor	
Source and Description of Fill Material <b>Imported Sand (T-6)</b>	Weather <b>Sunny</b>	Technician <b>Frank Shamfield</b>	
Key Persons Contacted (Civil Engr. Architect, Developer, etc.)			

Test #	Test Location	Elevation	Dry Density lbs/cu.ft.	Moisture Content %	Field Testing		Comp Curve No.	Maximum Dry Density lbs/cu.ft.	Optimum	Comments
					% of Maximum Dry Density					
1	Area 9 p. 2 ± 8	-12'	89.7	9.1	90.6			99.1	13.1%	Spec. 90%
2	" " " 12	-12'	91.3	8.6	92.2					
3	" " " 15	-25'	90.9	7.9	91.8					
4	" " " 15	-25'	90.0	8.4	90.9					
5	Area 5 p. 2 ± 27	-25'	89.6	8.5	90.5					
6	" " " 39	-35'	91.7	9.0	92.6					
7	" " " 52	-40'	90.1	8.8	91.0					
8	" " " 55	-35'	90.6	8.6	91.5					
9	" " " 28	-10'	90.0	9.1	90.9					
10	" " " 37	-10'	91.3	8.4	92.2					
11	" " " 50	-25'	91.1	8.3	92.0					
12	" " " 40	-25'	90.8	8.7	91.7					

Describe Equipment used for Hauling, Spreading, Watering, Conditioning and Compacting

Notes (Describe work completed during the day, any problems and their solution)

All tests showed adequate compaction and results meet or exceed project specifications.  
I will be on the project Monday morning to observe progress of work.

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Tel 503.620.7184

Report by

**Frank H. Shamfield**

Form #: HC Cco.02 (10/99)

POPT1S602533

**APPENDIX D  
LETTER OF ACCEPTANCE,  
LOAD SUMMARY, AND DISPOSAL MANIFESTS  
(SEE VOLUME II)**

**APPENDIX E**  
**QA REVIEW AND ANALYTICAL LABORATORY REPORTS**

## **APPENDIX E**

### **QA REVIEW AND ANALYTICAL LABORATORY REPORTS**

Seventy-six soil samples (plus five duplicates) were collected between October 9, 2002, and January 14, 2003. All soil samples were analyzed for diesel and oil-range petroleum hydrocarbons by Northwest Method NWTPH-Dx. Two soil samples (T-1 and Z-1) were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals by EPA Method 1311/6000/7000 Series. Selected soil samples were analyzed for polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270M-SIM.

The following criteria were evaluated in the standard data quality review process:

- Holding times;
- Method blanks;
- Surrogate recoveries;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries;
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries; and
- Laboratory duplicate relative percent difference (RPD).

#### ***Diesel and Oil-Range Petroleum Hydrocarbons***

**October 9 and 10, 2002 (Report # 1).** All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within control limits. Laboratory duplicates were within RPD limits. Detected hydrocarbons for sample TP-17 (9) had distinct peaks, with elution patterns similar to that of PAH's as well as other extraneous peaks possibly due to biogenic interference. Detected hydrocarbons for sample TP-30 (2-3) contained extraneous peaks, possibly due to biogenic interference; however, heavy oil was detected.

**October 9 and 10, 2002 (Report # 2).** All required holding times were met. No method blank contamination was detected. The LCS recovery was within control limits. Laboratory duplicates were within RPD limits. Detected hydrocarbons for sample TP-19 (9) had distinct peaks with elution patterns similar to those of PAH's as well as other extraneous peaks, possibly due to biogenic interference. The surrogate (1-Chlorooctadecane) recoveries for laboratory duplicate samples (2100484-DUP1 and 2100484-DUP2) were not available due to sample dilution required from high analyte concentration and/or matrix interference.

**December 5 and 17, 2002.** All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within control limits. The RPDs for laboratory duplicate samples (2120735-DUP1 and 2120735-DUP2) were not applicable for analyte concentrations less than five times the MRL.

**December 11, 2002.** All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within control limits. Laboratory duplicates were within RPD limits. Detected hydrocarbons for samples Stockpile 1, Stockpile 2, Stockpile 3, Stockpile 4, Stockpile 5, Stockpile 7, and Stockpile 8 were mainly due to overlap from the heavy/oil range; however, there was a trace of weathered diesel detected. Detected hydrocarbons in the diesel range for sample Stockpile 6 did not have a distinct diesel pattern and may have been due to heavily weathered diesel or possibly biogenic interference.

**December 20, 2002.** All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within control limits. Laboratory duplicates were within RPD limits.

**January 2, 2003.** All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within control limits. Laboratory duplicates were within RPD limits. Detected hydrocarbons in the diesel range for samples A-9/S-1 and A-9/S-2 did not have a distinct diesel pattern and may have been due to heavily weathered diesel or possibly biogenic interference. Detected hydrocarbons in the diesel range for sample A-9/S-1 had extraneous peaks that may have been due to biogenic interference; however, heavy oil was present. The reporting limits for samples A-9/S-3 and A-9/S-6 were raised due to dilution necessary for analysis. The samples contained high levels of reported analyte, non-target analyte, and/or matrix interference.

**January 8, 2003 (Report #1).** All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within control limits. Laboratory duplicates were within RPD limits. Detected hydrocarbons in the diesel range for samples A-5/S-6 and A-5/S-8 did not have a distinct diesel pattern and may have been due to heavily weathered diesel or possibly biogenic interference. Detected hydrocarbons in the diesel range for sample A-5/S-2, A-5/S-4, and A-5/S-9 had extraneous peaks that may have been due to biogenic interference; however, heavy oil was present. Detected hydrocarbons in sample A-5/S-2 had non-petroleum peaks or elution patterns suggesting the presence of biogenic interference. Detected hydrocarbons in sample A-5/S-3 were mainly due to overlap from the heavy/oil range; however, heavy oil was also present.

**January 8, 2003 (Report #2).** All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within control limits. Laboratory duplicates were within RPD limits.

**January 14, 2003.** All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within control limits. Laboratory duplicates were within RPD limits. Detected hydrocarbons in the diesel range for samples A-6/S-2 and A-7/S-1 did not have a distinct diesel pattern and may have been due to heavily weathered diesel or possibly biogenic interference. Detected hydrocarbons in sample A-6/S-2, A-7/S-1, and A-8/S-1 had non-petroleum peaks or elution patterns, suggesting the presence of biogenic interference.

### **TCLP Metals**

**December 20, 2002.** All required holding times were met. No method blank contamination was detected. LCS and MS recoveries were within control limits.

**January 8, 2003.** All required holding times were met. No method blank contamination was detected. LCS and MS recoveries were within control limits.

### **PAHs**

**October 9 and 10, 2002 (Report # 1).** All required holding times were met. No method blank contamination was detected. Surrogate, LCS, MS, and MS Dup recoveries were within control limits. The MS Dup was within RPD limits.

**October 9 and 10, 2002 (Report # 2).** All required holding times were met. No method blank contamination was detected. Surrogate, LCS, MS, and MS Dup recoveries were within control limits. The MS Dup was within RPD limits. The MS and MS Dup sample reporting limits were raised due to dilution necessary for analysis (containing high levels of reported analyte, non-target analyte, and/or matrix interference).

**December 11, 2002.** All required holding times were met. No method blank contamination was detected. Surrogate, LCS, MS, and MS Dup recoveries were within control limits. The MS Dup was within RPD limits. Stockpile 1, Stockpile 2, Stockpile 3, Stockpile 4, Stockpile 5, Stockpile 6, Stockpile 7, Stockpile 8, MS, and MS Dup reporting limits were raised due to dilution necessary for analysis (containing high levels of reported analyte, non-target analyte, and/or matrix interference).

**January 8, 2003 (Report #1).** All required holding times were met. No method blank contamination was detected. Surrogate, LCS, and MS Dup recoveries were within control limits. The MS Dup was within the RPD limits. Sample A-4/S-3, MS, and MS Dup samples reporting limits were raised due to dilution necessary for analysis (containing high levels of reported analyte, non-target analyte, and/or matrix interference). The spike recovery for benzo (a) pyrene and pyrene for the MS sample was outside of established control limits. Review of associated batch QC indicated the recovery of this analyte did not present an out-of-control condition for the batch.

**January 8, 2003 (Report #2).** All required holding times were met. No method blank contamination was detected. Surrogate, LCS, and MS Dup recoveries were within control limits. The MS Dup was within RPD limits. The MS and MS Dup sample reporting limits were raised due to dilution necessary for analysis (containing high levels of reported analyte, non-target analyte, and/or matrix interference). The spike recovery for benzo (a) pyrene and pyrene for the MS sample was outside of established control limits. Review of associated batch QC indicated the recovery of this analyte did not present an out-of-control condition for the batch.

**January 14, 2003.** All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within control limits. The MS Dup was within RPD limits. Reporting limits for samples A-6/S-2, A-7/S-1, A-8/S-1, and A-8/S-3 were raised due to dilution necessary for analysis (containing high levels of reported analyte, non-target analyte, and/or matrix interference).

Upon review, all data are suitable for their intended purposes. Please see the laboratory report for Quality Assurance/Quality Control (QA/QC) results and discussions.



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Hart Crowser  
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Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

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Reported:  
01/23/03 14:28

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
A-3/S-1	P3A0355-01	Soil	01/14/03 10:20	01/14/03 13:35
A-3/S-10	P3A0355-02	Soil	01/14/03 10:20	01/14/03 13:35
A-5/S-11	P3A0355-03	Soil	01/14/03 10:00	01/14/03 13:35
A-5/S-110	P3A0355-04	Soil	01/14/03 10:00	01/14/03 13:35
A-6/S-10	P3A0355-05	Soil	01/14/03 07:50	01/14/03 13:35
A-6/S-1	P3A0355-06	Soil	01/14/03 07:50	01/14/03 13:35
A-6/S-2	P3A0355-07	Soil	01/14/03 07:57	01/14/03 13:35
A-7/S-1	P3A0355-08	Soil	01/14/03 08:08	01/14/03 13:35
A-7/S-2	P3A0355-09	Soil	01/14/03 08:20	01/14/03 13:35
A-7/S-3	P3A0355-10	Soil	01/14/03 08:26	01/14/03 13:35
A-7/S-30	P3A0355-11	Soil	01/14/03 08:26	01/14/03 13:35
A-7/S-4	P3A0355-12	Soil	01/14/03 08:35	01/14/03 13:35
A-8/S-1	P3A0355-13	Soil	01/14/03 09:39	01/14/03 13:35
A-8/S-2	P3A0355-14	Soil	01/14/03 09:30	01/14/03 13:35
A-8/S-20	P3A0355-15	Soil	01/14/03 09:30	01/14/03 13:35
A-8/S-3	P3A0355-16	Soil	01/14/03 09:45	01/14/03 13:35
A-8/S-4	P3A0355-17	Soil	01/14/03 08:55	01/14/03 13:35
A-8/S-5	P3A0355-18	Soil	01/14/03 09:15	01/14/03 13:35

HART CROWSER, INC.

JAN 27 2003

Portland Office

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602540



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Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-3/S-1 (P3A0355-01) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	116	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	108 %	50-150							
<b>A-3/S-10 (P3A0355-02) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	108 %	50-150							
<b>A-5/S-11 (P3A0355-03) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	389	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	551	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	68.7 %	50-150							
<b>A-5/S-110 (P3A0355-04) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	346	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	542	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	75.3 %	50-150							
<b>A-6/S-10 (P3A0355-05) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	82.9 %	50-150							
<b>A-6/S-1 (P3A0355-06) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	86.4 %	50-150							

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Lisa Domenighini, Project Manager

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Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-6/S-2 (P3A0355-07) Soil</b> <span style="float: right;">Sampled: 01/14/03 Received: 01/14/03</span>									
Diesel Range Organics	131	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	D-17
Heavy Oil Range Hydrocarbons	208	50.0	"	"	"	"	"	"	D-15
Surr: 1-Chlorooctadecane	111 %	50-150							
<b>A-7/S-1 (P3A0355-08) Soil</b> <span style="float: right;">Sampled: 01/14/03 Received: 01/14/03</span>									
Diesel Range Organics	252	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	D-17
Heavy Oil Range Hydrocarbons	458	50.0	"	"	"	"	"	"	D-15
Surr: 1-Chlorooctadecane	67.2 %	50-150							
<b>A-7/S-2 (P3A0355-09) Soil</b> <span style="float: right;">Sampled: 01/14/03 Received: 01/14/03</span>									
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	88.4 %	50-150							
<b>A-7/S-3 (P3A0355-10) Soil</b> <span style="float: right;">Sampled: 01/14/03 Received: 01/14/03</span>									
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	87.4 %	50-150							
<b>A-7/S-30 (P3A0355-11) Soil</b> <span style="float: right;">Sampled: 01/14/03 Received: 01/14/03</span>									
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	87.2 %	50-150							
<b>A-7/S-4 (P3A0355-12) Soil</b> <span style="float: right;">Sampled: 01/14/03 Received: 01/14/03</span>									
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	86.0 %	50-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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Project Manager: Levi Fernandes

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Reported:  
01/23/03 14:28

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-8/S-1 (P3A0355-13) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	404	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/16/03	3010440	
Heavy Oil Range Hydrocarbons	666	50.0	"	"	"	"	"	"	D-15
Surr: 1-Chlorooctadecane	92.3 %	50-150							
<b>A-8/S-2 (P3A0355-14) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/17/03	3010440	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	92.3 %	50-150							
<b>A-8/S-20 (P3A0355-15) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/17/03	3010440	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	93.8 %	50-150							
<b>A-8/S-3 (P3A0355-16) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/20/03	3010464	
Heavy Oil Range Hydrocarbons	297	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	98.5 %	50-150							
<b>A-8/S-4 (P3A0355-17) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	156	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/20/03	3010464	
Heavy Oil Range Hydrocarbons	327	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	111 %	50-150							
<b>A-8/S-5 (P3A0355-18) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/16/03	01/18/03	3010464	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	85.9 %	50-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602543



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-6/S-1 (P3A0355-06) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	01/17/03	01/21/03	3010475	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	66.4 %	40-150							
Surr: Pyrene-d10	69.1 %	40-150							
Surr: Benzo (a) pyrene-d12	68.6 %	40-150							

<b>A-6/S-2 (P3A0355-07) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			<b>R-05</b>
Acenaphthene	ND	26.8	ug/kg dry	2	EPA 8270m	01/17/03	01/21/03	3010475	
Acenaphthylene	ND	26.8	"	"	"	"	"	"	
Anthracene	ND	26.8	"	"	"	"	"	"	
Benzo (a) anthracene	28.7	26.8	"	"	"	"	"	"	
Benzo (a) pyrene	26.8	26.8	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	26.8	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	26.8	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	26.8	"	"	"	"	"	"	
Chrysene	35.0	26.8	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	26.8	"	"	"	"	"	"	
Fluoranthene	69.4	26.8	"	"	"	"	"	"	
Fluorene	ND	26.8	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	26.8	"	"	"	"	"	"	
Naphthalene	ND	26.8	"	"	"	"	"	"	
Phenanthrene	61.8	26.8	"	"	"	"	"	"	
Pyrene	68.9	26.8	"	"	"	"	"	"	
Surr: Fluorene-d10	66.2 %	40-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602544



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-6/S-2 (P3A0355-07) Soil</b>						Sampled: 01/14/03 Received: 01/14/03		<b>R-05</b>	
Surr: Pyrene-d10	69.0 %	40-150							
Surr: Benzo (a) pyrene-d12	66.1 %	40-150							
<b>A-7/S-1 (P3A0355-08) Soil</b>						Sampled: 01/14/03 Received: 01/14/03		<b>R-05</b>	
Acenaphthene	ND	26.8	ug/kg dry	2	EPA 8270m	01/17/03	01/21/03	3010475	
Acenaphthylene	ND	26.8	"	"	"	"	"	"	
Anthracene	27.3	26.8	"	"	"	"	"	"	
Benzo (a) anthracene	51.7	26.8	"	"	"	"	"	"	
Benzo (a) pyrene	46.9	26.8	"	"	"	"	"	"	
Benzo (b) fluoranthene	45.7	26.8	"	"	"	"	"	"	
Benzo (ghi) perylene	34.7	26.8	"	"	"	"	"	"	
Benzo (k) fluoranthene	40.3	26.8	"	"	"	"	"	"	
Chrysene	66.7	26.8	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	26.8	"	"	"	"	"	"	
Fluoranthene	166	26.8	"	"	"	"	"	"	
Fluorene	ND	26.8	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	28.3	26.8	"	"	"	"	"	"	
Naphthalene	ND	26.8	"	"	"	"	"	"	
Phenanthrene	112	26.8	"	"	"	"	"	"	
Pyrene	161	26.8	"	"	"	"	"	"	
Surr: Fluorene-d10	68.6 %	40-150							
Surr: Pyrene-d10	67.0 %	40-150							
Surr: Benzo (a) pyrene-d12	65.2 %	40-150							
<b>A-7/S-2 (P3A0355-09) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	01/17/03	01/21/03	3010475	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	15.4	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	

North Creek Analytical - Portland

*Lisa Domenighini*

Lisa Domenighini, Project Manager

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POPT1S602545



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-7/S-2 (P3A0355-09) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Naphthalene	ND	13.4	ug/kg dry	1	EPA 8270m	01/17/03	01/21/03	3010475	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	18.4	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	60.2 %	40-150							
Surr: Pyrene-d10	66.0 %	40-150							
Surr: Benzo (a) pyrene-d12	64.7 %	40-150							
<b>A-7/S-3 (P3A0355-10) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	01/17/03	01/21/03	3010475	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	66.6 %	40-150							
Surr: Pyrene-d10	68.0 %	40-150							
Surr: Benzo (a) pyrene-d12	66.6 %	40-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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Environmental Laboratory Network

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POPT1S602546



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

## Polynuclear Aromatic Compounds per EPA 8270M-SIM

### North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
A-7/S-4 (P3A0355-12) Soil						Sampled: 01/14/03 Received: 01/14/03			
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	01/17/03	01/21/03	3010475	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	67.9 %	40-150							
Surr: Pyrene-d10	65.7 %	40-150							
Surr: Benzo (a) pyrene-d12	59.8 %	40-150							

A-8/S-1 (P3A0355-13) Soil						Sampled: 01/14/03 Received: 01/14/03			R-05
Acenaphthene	ND	67.0	ug/kg dry	5	EPA 8270m	01/17/03	01/21/03	3010475	
Acenaphthylene	ND	67.0	"	"	"	"	"	"	
Anthracene	ND	67.0	"	"	"	"	"	"	
Benzo (a) anthracene	96.5	67.0	"	"	"	"	"	"	
Benzo (a) pyrene	80.6	67.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	67.0	"	"	"	"	"	"	
Benzo (ghi) perylene	80.0	67.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	67.0	"	"	"	"	"	"	
Chrysene	110	67.0	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	67.0	"	"	"	"	"	"	
Fluoranthene	561	67.0	"	"	"	"	"	"	
Fluorene	ND	67.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	67.0	"	"	"	"	"	"	
Naphthalene	ND	67.0	"	"	"	"	"	"	
Phenanthrene	365	67.0	"	"	"	"	"	"	
Pyrene	429	67.0	"	"	"	"	"	"	
Surr: Fluorene-d10	77.3 %	40-150							

North Creek Analytical - Portland

*Lisa Domenighini*

Lisa Domenighini, Project Manager.

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POPT1S602547



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Hart Crowser  
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Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-8/S-1 (P3A0355-13) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			R-05
Surr: Pyrene-d10	72.3 %	40-150							
Surr: Benzo (a) pyrene-d12	69.2 %	40-150							
<b>A-8/S-3 (P3A0355-16) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			R-05
Acenaphthene	ND	67.0	ug/kg dry	2	EPA 8270m	01/17/03	01/21/03	3010475	
Acenaphthylene	ND	67.0	"	"	"	"	"	"	
Anthracene	ND	67.0	"	"	"	"	"	"	
Benzo (a) anthracene	ND	67.0	"	"	"	"	"	"	
Benzo (a) pyrene	76.6	67.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	67.0	67.0	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	67.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	67.0	"	"	"	"	"	"	
Chrysene	82.5	67.0	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	67.0	"	"	"	"	"	"	
Fluoranthene	116	67.0	"	"	"	"	"	"	
Fluorene	ND	67.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	67.0	"	"	"	"	"	"	
Naphthalene	ND	67.0	"	"	"	"	"	"	
Phenanthrene	89.9	67.0	"	"	"	"	"	"	
Pyrene	142	67.0	"	"	"	"	"	"	
Surr: Fluorene-d10	78.2 %	40-150							
Surr: Pyrene-d10	80.7 %	40-150							
Surr: Benzo (a) pyrene-d12	77.9 %	40-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602548



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
A-3/S-1 (P3A0355-01) Soil						Sampled: 01/14/03 Received: 01/14/03			
% Solids	90.2	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
A-3/S-10 (P3A0355-02) Soil						Sampled: 01/14/03 Received: 01/14/03			
% Solids	89.9	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
A-5/S-11 (P3A0355-03) Soil						Sampled: 01/14/03 Received: 01/14/03			
% Solids	80.0	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
A-5/S-110 (P3A0355-04) Soil						Sampled: 01/14/03 Received: 01/14/03			
% Solids	77.9	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
A-6/S-10 (P3A0355-05) Soil						Sampled: 01/14/03 Received: 01/14/03			
% Solids	90.4	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
A-6/S-1 (P3A0355-06) Soil						Sampled: 01/14/03 Received: 01/14/03			
% Solids	90.6	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
A-6/S-2 (P3A0355-07) Soil						Sampled: 01/14/03 Received: 01/14/03			
% Solids	76.5	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
A-7/S-1 (P3A0355-08) Soil						Sampled: 01/14/03 Received: 01/14/03			
% Solids	65.1	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
A-7/S-2 (P3A0355-09) Soil						Sampled: 01/14/03 Received: 01/14/03			
% Solids	82.1	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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Environmental Laboratory Network

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POPT1S602549



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541.383.9310 fax 541.382.7588  
Anchorage 3209 Denali Street, Anchorage, AK 99503  
907.334.9200 fax 907.334.9210

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-7/S-3 (P3A0355-10) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
% Solids	91.6	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
<b>A-7/S-30 (P3A0355-11) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
% Solids	91.4	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
<b>A-7/S-4 (P3A0355-12) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
% Solids	91.1	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
<b>A-8/S-1 (P3A0355-13) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
% Solids	72.1	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
<b>A-8/S-2 (P3A0355-14) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
% Solids	88.6	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
<b>A-8/S-20 (P3A0355-15) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
% Solids	87.8	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
<b>A-8/S-3 (P3A0355-16) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
% Solids	90.0	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
<b>A-8/S-4 (P3A0355-17) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
% Solids	85.6	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	
<b>A-8/S-5 (P3A0355-18) Soil</b>						Sampled: 01/14/03 Received: 01/14/03			
% Solids	88.8	1.00 % by Weight		1	NCA SOP	01/17/03	01/18/03	3010513	

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

North Creek Analytical, Inc.  
Environmental Laboratory Network

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POPT1S602550



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907.334.9200 fax 907.334.9210

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3010440 - EPA 3550 Fuels**

**Blank (3010440-BLK1)**

Prepared & Analyzed: 01/16/03

Diesel Range Organics	ND	25.0	mg/kg						
Heavy Oil Range Hydrocarbons	ND	50.0	"						
Surr: 1-Chlorooctadecane	4.62		"	4.80		96.2	50-150		

**LCS (3010440-BS1)**

Prepared & Analyzed: 01/16/03

Diesel Range Organics	125	25.0	mg/kg	125		100	50-150		
Heavy Oil Range Hydrocarbons	68.6	50.0	"	75.0		91.5	50-150		
Surr: 1-Chlorooctadecane	4.91		"	4.80		102	50-150		

**Duplicate (3010440-DUP1)**

Source: P3A0350-05

Prepared & Analyzed: 01/16/03

Diesel Range Organics	ND	25.0	mg/kg dry		ND			50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND			50	
Surr: 1-Chlorooctadecane	5.63		"	6.02		93.5	50-150		

**Duplicate (3010440-DUP2)**

Source: P3A0350-06

Prepared & Analyzed: 01/16/03

Diesel Range Organics	ND	25.0	mg/kg dry		ND			50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND			50	
Surr: 1-Chlorooctadecane	5.83		"	5.73		102	50-150		

**Batch 3010464 - EPA 3550 Fuels**

**Blank (3010464-BLK1)**

Prepared: 01/16/03 Analyzed: 01/17/03

Diesel Range Organics	ND	25.0	mg/kg						
Heavy Oil Range Hydrocarbons	ND	50.0	"						
Surr: 1-Chlorooctadecane	4.15		"	4.80		86.5	50-150		

**LCS (3010464-BS1)**

Prepared: 01/16/03 Analyzed: 01/20/03

Diesel Range Organics	118	25.0	mg/kg	125		94.4	50-150		
Heavy Oil Range Hydrocarbons	72.9	50.0	"	75.0		97.2	50-150		
Surr: 1-Chlorooctadecane	4.72		"	4.80		98.3	50-150		

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

North Creek Analytical, Inc.  
Environmental Laboratory Network

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POPT1S602551



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907.334.9200 fax 907.334.9210

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3010464 - EPA 3550 Fuels**

<b>Duplicate (3010464-DUP1)</b>	<b>Source: P3A0414-05</b>		<b>Prepared: 01/16/03</b>		<b>Analyzed: 01/18/03</b>				
Diesel Range Organics	511	25.0	mg/kg dry		489		4.40	50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND			50	
Surr: 1-Chlorooctadecane	5.23		"	5.16		101	50-150		

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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North Creek Analytical, Inc.  
Environmental Laboratory Network

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POPT1S602552



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Hart Crowser  
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Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Anchorage 3209 Denali Street, Anchorage, AK 99503  
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Reported:  
01/23/03 14:28

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3010475 - EPA 3550

Blank (3010475-BLK1)

Prepared: 01/17/03 Analyzed: 01/21/03

1-Methylnaphthalene	ND	13.4	ug/kg							
2-Methylnaphthalene	ND	13.4	"							
Acenaphthene	ND	13.4	"							
Acenaphthylene	ND	13.4	"							
Anthracene	ND	13.4	"							
Benzo (a) anthracene	ND	13.4	"							
Benzo (a) pyrene	ND	13.4	"							
Benzo (b) fluoranthene	ND	13.4	"							
Benzo (ghi) perylene	ND	13.4	"							
Benzo (k) fluoranthene	ND	13.4	"							
Chrysene	ND	13.4	"							
Dibenzo (a,h) anthracene	ND	13.4	"							
Fluoranthene	ND	13.4	"							
Fluorene	ND	13.4	"							
Indeno (1,2,3-cd) pyrene	ND	13.4	"							
Naphthalene	ND	13.4	"							
Phenanthrene	ND	13.4	"							
Pyrene	ND	13.4	"							
Surr: Fluorene-d10	55.5		"	83.3		66.6	40-150			
Surr: Pyrene-d10	60.5		"	83.3		72.6	40-150			
Surr: Benzo (a) pyrene-d12	58.1		"	83.3		69.7	40-150			

LCS (3010475-BS1)

Prepared: 01/17/03 Analyzed: 01/21/03

Acenaphthene	117	13.4	ug/kg	167		70.1	33-139			
Benzo (a) pyrene	118	13.4	"	167		70.7	45-149			
Pyrene	117	13.4	"	167		70.1	39-138			
Surr: Fluorene-d10	57.8		"	83.3		69.4	40-150			
Surr: Pyrene-d10	58.8		"	83.3		70.6	40-150			
Surr: Benzo (a) pyrene-d12	59.3		"	83.3		71.2	40-150			

North Creek Analytical - Portland

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*Lisa Domenighini*

Lisa Domenighini, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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POPT1S602553



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch 3010475 - EPA 3550

Matrix Spike (3010475-MS1) Source: P3A0355-10 Prepared: 01/17/03 Analyzed: 01/21/03

Acenaphthene	128	13.4	ug/kg dry	182	ND	70.3	33-139		
Benzo (a) pyrene	128	13.4	"	182	ND	70.3	45-149		
Pyrene	130	13.4	"	182	ND	71.4	39-138		
Surr: Fluorene-d10	58.7		"	91.0		64.5	40-150		
Surr: Pyrene-d10	62.9		"	91.0		69.1	40-150		
Surr: Benzo (a) pyrene-d12	61.7		"	91.0		67.8	40-150		

Matrix Spike Dup (3010475-MSD1) Source: P3A0355-10 Prepared: 01/17/03 Analyzed: 01/21/03

Acenaphthene	125	13.4	ug/kg dry	182	ND	68.7	33-139	2.37	60
Benzo (a) pyrene	127	13.4	"	182	ND	69.8	45-149	0.784	60
Pyrene	129	13.4	"	182	ND	70.9	39-138	0.772	60
Surr: Fluorene-d10	59.9		"	91.0		65.8	40-150		
Surr: Pyrene-d10	62.0		"	91.0		68.1	40-150		
Surr: Benzo (a) pyrene-d12	60.4		"	91.0		66.4	40-150		

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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Environmental Laboratory Network

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POPT1S602554



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Hart Crowser  
 Five Centerpointe Drive  
 Lake Oswego, OR 97035

Project: POP - T-1  
 Project Number: 15230-05  
 Project Manager: Levi Fernandes

Reported:  
 01/23/03 14:28

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3010513 - Dry Weight</b>										
<b>Duplicate (3010513-DUP1)</b>	<b>Source: P3A0350-01</b>		<b>Prepared: 01/17/03 Analyzed: 01/18/03</b>							
% Solids	79.3	1.00 % by Weight			79.1			0.253	20	
<b>Duplicate (3010513-DUP2)</b>	<b>Source: P3A0355-01</b>		<b>Prepared: 01/17/03 Analyzed: 01/18/03</b>							
% Solids	90.0	1.00 % by Weight			90.2			0.222	20	
<b>Duplicate (3010513-DUP3)</b>	<b>Source: P3A0468-01</b>		<b>Prepared: 01/17/03 Analyzed: 01/18/03</b>							
% Solids	90.5	1.00 % by Weight			90.6			0.110	20	

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602555



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/23/03 14:28

#### Notes and Definitions

- D-15 Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.
- D-17 Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
- R-05 Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
- wet Sample results reported on a wet weight basis (as received)
- RPD Relative Percent Difference

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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Environmental Laboratory Network

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POPT1S602556

## CHAIN OF CUSTODY REPORT

Work Order #: P3A0355

CLIENT: <u>Hart Crowser</u> REPORT TO: <u>Levi Fernandez</u> ADDRESS: <u>5 Centerville Dr. Suite 240</u> <u>Lake Oswego, OR 97035</u> PHONE: <u>503-620-7284</u> FAX: <u>503-620-6918</u>			INVOICE TO:  <u>&lt; Same</u>  P.O. NUMBER:			<b>TURNAROUND REQUEST In Business Days*</b> Organic & Inorganic Analyses <div style="display: flex; justify-content: space-around;"> <span>[10] [7] [5] [4] [3] [2] [1] [&lt;1]</span> </div> STD. Petroleum Hydrocarbon Analyses <div style="display: flex; justify-content: space-around;"> <span>[5] [4] [3] [2] [1] [&lt;1]</span> </div> STD. Please Specify <div style="display: flex; align-items: center;"> <input checked="" type="checkbox"/> OTHER <u>KOOLY (Jan. 24)</u> </div> <small>*Turnaround Request less than standard may incur Rush Charges.</small>									
PROJECT NAME: <u>PSP - T1</u> PROJECT NUMBER: <u>16230-05</u> SAMPLED BY: <u>TWS</u>			REQUESTED ANALYSES												
CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NUTRA-OX	PAHS							MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WORK ID		
1. A-3/S-1	01/14/03 1020	X								S	1				
2. A-3/S-10	1020														
3. A-5/S-11	1000														
4. A-5/S-110	1000														
5. A-6/S-10	0750														
6. A-6/S-1	0750		X								✓				
7. A-6/S-2	0757		X								2				
8. A-7/S-1	0808		X												
9. A-7/S-2	0820		X								✓				
10. A-7/S-3	0826		X								1				
11. A-7/S-30	0826										1				
12. A-7/S-4	0835		X								2				
13. A-8/S-1	0939										2				
14. A-8/S-2	0900										1				
15. A-8/S-20	✓ 0930 ✓	✓									1				
RELINQUISHED BY: <u>[Signature]</u>		DATE: <u>01/14/03</u>		RECEIVED BY: <u>[Signature]</u>		DATE: <u>1-14-03</u>									
PRINT NAME: <u>Jim Skutski</u>		FIRM: <u>Hart Crowser</u>		TIME: <u>1035</u>		PRINT NAME: <u>Simon Passarge</u>		FIRM: <u>NCA</u>		TIME: <u>1335</u>					
RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:									
PRINT NAME:		FIRM:		TIME:		PRINT NAME:		FIRM:		TIME:					
ADDITIONAL REMARKS:															
COC REV 3/99												TEMP: <u>4.9</u>		PAGE <u>1</u> OF <u>2</u>	

## CHAIN OF CUSTODY REPORT

Work Order #: P3A0355

CLIENT: <b>Hart Crouser</b>			INVOICE TO:			TURNAROUND REQUEST in Business Days*												
REPORT TO: <b>Levi Fernandez</b>			← Same			Organic & Inorganic Analyses												
ADDRESS: <b>5 Centerpointe Dr. Suite 240 Lake Oswego, OR 97035</b>						10 7 5 4 3 2 1 <1												
PHONE: <b>503-620-7284</b>			FAX: <b>503-620-6918</b>			STD.			Petroleum Hydrocarbon Analyses									
PROJECT NAME: <b>Pop. T1</b>			P.O. NUMBER:			STD.			5 4 3 2 1 <1									
PROJECT NUMBER: <b>15230-05</b>			REQUESTED ANALYSES			Please Specify												
SAMPLED BY: <b>TWS</b>						<input checked="" type="checkbox"/> OTHER <b>10 day (Jan 24)</b>												
						*Turnaround Requests less than standard may incur Rush Charges.												
CLIENT SAMPLE IDENTIFICATION		SAMPLING DATE/TIME	METALS	PAHS											MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WORK ID
1. <b>A-8/S-3</b>		<b>01/14/03 0945</b>	<b>X</b>	<b>X</b>											<b>S</b>	<b>2</b>		
2. <b>A-8/S-4</b>		<b>0855</b>	<b>↓</b>												<b>↓</b>	<b>↓</b>		
3. <b>A-8/S-5</b>		<b>0915</b>	<b>↓</b>												<b>↓</b>	<b>↓</b>		
4.																		
5.																		
6.																		
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9.																		
10.																		
11.																		
12.																		
13.																		
14.																		
15.																		
RELINQUISHED BY: <b>[Signature]</b>			DATE: <b>01/14/03</b>			RECEIVED BY: <b>[Signature]</b>			DATE: <b>1-14-03</b>									
PRINT NAME: <b>Tim Skretski</b>			FIRM: <b>Hart Crouser</b>			PRINT NAME: <b>Sarah Passarelli</b>			FIRM: <b>NCA</b>									
RELINQUISHED BY:			DATE:			RECEIVED BY:			DATE:									
PRINT NAME:			FIRM:			PRINT NAME:			FIRM:									
TIME:			TIME:			TIME:			TIME:									
ADDITIONAL REMARKS:																		
COC REV. 099																		
CC Client TEMP 4.9																		
PAGE 2 OF 2																		

# NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: HC

1. Please sign for receipt and opening of 1 cooler or other  
 By (print) Sarah Passare (sign) [Signature]
2. Date samples received 1/14/03 Date opened: Same ☒ or 1/1/
3. Delivered by: ☐ NCA courier ☐ FedEx ☐ UPS ☒ Courier ☐ Client ☐ Other  
 Airbill # if applicable \_\_\_\_\_ (Put copy of shipping papers in file)
4. There were 0 custody seals present, signed by \_\_\_\_\_ date 1/1/
5. Were the custody seals unbroken and intact at the date and time of arrival? ☐ Yes ☐ No
6. Was ice used? ☒ yes ☐ no Type of ice: ☐ blue ice ☐ gel ice ☒ real ice  
 Temperature (degrees C) 49 Raytek thermometer 14 Digi-Therm (probe temperature blank)
7. Are custody papers sealed in a plastic bag and taped inside to lid? ☐ Yes ☒ No
8. Were custody papers filled out properly (ink, signed, etc.)? ☒ Yes ☐ No  
 If "no" please specify: \_\_\_\_\_
9. Was project identifiable from custody papers? ☒ Yes ☐ No  
 Name of project PDP-TI (if applicable)
10. Initial and date for unpacking: SP (initials) date 1/14/03
11. Packing material: N/A bubble wrap/bag ☐ styrofoam ☐ cardboard ☐ other
12. Were samples in bags? ☐ Yes ☒ No
13. Did all containers indicated on the COC arrive? ☒ Yes ☐ No  
 If "no" please indicate which containers were absent \_\_\_\_\_
14. Were all containers unbroken and labels in good condition? ☒ Yes ☐ No  
 If "no" please indicate which containers \_\_\_\_\_
15. Were all bottle labels complete (ID, date, time, signature, etc.)? ☒ Yes ☐ No  
 Do the IDs, times, etc. agree with the COC? ☒ Yes ☐ No  
 If "no" please indicate which containers labeled year 2002 - client confirmed date is actually 2003
16. Are containers properly preserved for indicated analysis? ☒ Yes ☐ No
17. Is there adequate volume for the test(s) requested? ☒ Yes ☐ No
18. If voa vials were submitted, are they free of bubbles? ☒ N/A ☐ Yes ☐ No
19. Log-in phase: Date samples were logged in: 1/14/03 Elm Project # P3A0355
20. Logged in by (print) Kim Davis (sign) [Signature]
21. Was the project manager notified of status? (Use back of form as a record) ☒ Yes ☐ No



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Anchorage 3209 Dental Street, Anchorage, AK 99503  
907.334.9338 fax 907.334.9339

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
A-4/ S-1	P3A0202-01	Soil	01/08/03 13:40	01/08/03 15:42
A-4/ S-2	P3A0202-02	Soil	01/08/03 13:43	01/08/03 15:42
A-4/ S-3	P3A0202-03	Soil	01/08/03 13:47	01/08/03 15:42
A-4/ S-4	P3A0202-04	Soil	01/08/03 13:51	01/08/03 15:42
A-4/ S-5	P3A0202-05	Soil	01/08/03 13:54	01/08/03 15:42
A-5/S-1	P3A0202-06	Soil	01/08/03 14:08	01/08/03 15:42
A-5/S-2	P3A0202-07	Soil	01/08/03 14:11	01/08/03 15:42
A-5/S-3	P3A0202-08	Soil	01/08/03 14:18	01/08/03 15:42
A-5/S-4	P3A0202-09	Soil	01/08/03 14:14	01/08/03 15:42
A-5/S-5	P3A0202-10	Soil	01/08/03 14:22	01/08/03 15:42
A-5/S-6	P3A0202-11	Soil	01/08/03 14:26	01/08/03 15:42
A-5/S-7	P3A0202-12	Soil	01/08/03 14:27	01/08/03 15:42
A-5/S-8	P3A0202-13	Soil	01/08/03 14:34	01/08/03 15:42
A-5/S-9	P3A0202-14	Soil	01/08/03 14:38	01/08/03 15:42
A-5/S-10	P3A0202-15	Soil	01/08/03 14:43	01/08/03 15:42

HART CROWSER, INC.  
HART CROWSER, INC.

JAN 22 2003

Portland Office

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602560



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Hart Crowder  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-4/ S-1 (P3A0202-01) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/09/03	3010209	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	93.4 %	50-150							
<b>A-4/ S-2 (P3A0202-02) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/09/03	3010209	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	80.8 %	50-150							
<b>A-4/ S-3 (P3A0202-03) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/09/03	3010209	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	83.8 %	50-150							
<b>A-4/ S-4 (P3A0202-04) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/09/03	3010209	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	86.5 %	50-150							
<b>A-4/ S-5 (P3A0202-05) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	108 %	50-150							
<b>A-5/S-1 (P3A0202-06) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	110 %	50-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602561



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

### Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
A-5/S-2 (P3A0202-07) Soil						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	46.4	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	D-15 ✓
Heavy Oil Range Hydrocarbons	71.4	50.0	"	"	"	"	"	"	A-01 ✓
Surr: 1-Chlorooctadecane	113 %	50-150							
A-5/S-3 (P3A0202-08) Soil						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	93.9	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	A-02
Heavy Oil Range Hydrocarbons	203	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	102 %	50-150							
A-5/S-4 (P3A0202-09) Soil						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	
Heavy Oil Range Hydrocarbons	81.7	50.0	"	"	"	"	"	"	A-01 ✓
Surr: 1-Chlorooctadecane	90.0 %	50-150							
A-5/S-5 (P3A0202-10) Soil						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	83.3 %	50-150							
A-5/S-6 (P3A0202-11) Soil						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	69.1	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	D-17 ✓
Heavy Oil Range Hydrocarbons	88.2	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	102 %	50-150							
A-5/S-7 (P3A0202-12) Soil						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	83.6 %	50-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-5/S-8 (P3A0202-13) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	31.0	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	D-17
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	97.2 %	50-150							
<b>A-5/S-9 (P3A0202-14) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	31.0	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	
Heavy Oil Range Hydrocarbons	66.3	50.0	"	"	"	"	"	"	A-01
Surr: 1-Chlorooctadecane	86.3 %	50-150							
<b>A-5/S-10 (P3A0202-15) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/10/03	01/10/03	3010252	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	82.1 %	50-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602563



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Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

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Reported:  
01/17/03 15:18

### Polynuclear Aromatic Compounds per EPA 8270M-SIM North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
A-4/ S-3 (P3A0202-03) Soil						Sampled: 01/08/03	Received: 01/08/03	R-05	
Acenaphthene	ND	26.8	ug/kg dry	2	EPA 8270m	01/13/03	01/15/03	3010315	
Acenaphthylene	27.7	26.8	"	"	"	"	"	"	
Anthracene	42.2	26.8	"	"	"	"	"	"	
Benzo (a) anthracene	195	26.8	"	"	"	"	"	"	
Benzo (a) pyrene	162	26.8	"	"	"	"	"	"	
Benzo (b) fluoranthene	86.2	26.8	"	"	"	"	"	"	
Benzo (ghi) perylene	87.5	26.8	"	"	"	"	"	"	
Benzo (k) fluoranthene	114	26.8	"	"	"	"	"	"	
Chrysene	200	26.8	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	29.1	26.8	"	"	"	"	"	"	
Fluoranthene	226	26.8	"	"	"	"	"	"	
Fluorene	ND	26.8	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	78.9	26.8	"	"	"	"	"	"	
Naphthalene	ND	26.8	"	"	"	"	"	"	
Phenanthrene	142	26.8	"	"	"	"	"	"	
Pyrene	268	26.8	"	"	"	"	"	"	
Surr: Fluorene-d10	62.3 %	40-150							
Surr: Pyrene-d10	69.2 %	40-150							
Surr: Benzo (a) pyrene-d12	68.4 %	40-150							

A-5/S-1 (P3A0202-06) Soil						Sampled: 01/08/03	Received: 01/08/03		
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	01/13/03	01/14/03	3010315	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	96.8 %	40-150							

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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POPT1S602564



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-5/S-1 (P3A0202-06) Soil</b>									
						Sampled: 01/08/03 Received: 01/08/03			
Surr: Pyrene-d10	100 %	40-150							
Surr: Benzo (a) pyrene-d12	85.5 %	40-150							
<b>A-5/S-5 (P3A0202-10) Soil</b>									
						Sampled: 01/08/03 Received: 01/08/03			
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	01/13/03	01/14/03	3010315	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	24.9	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	20.5	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	14.3	13.4	"	"	"	"	"	"	
Chrysene	23.9	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	22.7	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	32.6	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	94.4 %	40-150							
Surr: Pyrene-d10	96.3 %	40-150							
Surr: Benzo (a) pyrene-d12	85.3 %	40-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602565



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Hart Crowser  
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Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-4/ S-1 (P3A0202-01) Soil</b> <span style="float: right;">Sampled: 01/08/03 Received: 01/08/03</span>									
% Solids	93.0	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-4/ S-2 (P3A0202-02) Soil</b> <span style="float: right;">Sampled: 01/08/03 Received: 01/08/03</span>									
% Solids	69.4	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-4/ S-3 (P3A0202-03) Soil</b> <span style="float: right;">Sampled: 01/08/03 Received: 01/08/03</span>									
% Solids	73.8	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-4/ S-4 (P3A0202-04) Soil</b> <span style="float: right;">Sampled: 01/08/03 Received: 01/08/03</span>									
% Solids	85.5	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-4/ S-5 (P3A0202-05) Soil</b> <span style="float: right;">Sampled: 01/08/03 Received: 01/08/03</span>									
% Solids	85.0	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-5/S-1 (P3A0202-06) Soil</b> <span style="float: right;">Sampled: 01/08/03 Received: 01/08/03</span>									
% Solids	89.5	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-5/S-2 (P3A0202-07) Soil</b> <span style="float: right;">Sampled: 01/08/03 Received: 01/08/03</span>									
% Solids	68.2	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-5/S-3 (P3A0202-08) Soil</b> <span style="float: right;">Sampled: 01/08/03 Received: 01/08/03</span>									
% Solids	71.5	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-5/S-4 (P3A0202-09) Soil</b> <span style="float: right;">Sampled: 01/08/03 Received: 01/08/03</span>									
% Solids	66.0	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	

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Lisa Domenighini, Project Manager

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POPT1S602566



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Anchorage 3209 Denali Street, Anchorage, AK 99503  
907.334.9338 fax 907.334.9339

Reported:  
01/17/03 15:18

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-5/S-5 (P3A0202-10) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
% Solids	91.2	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-5/S-6 (P3A0202-11) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
% Solids	93.6	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-5/S-7 (P3A0202-12) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
% Solids	80.3	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-5/S-8 (P3A0202-13) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
% Solids	88.9	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-5/S-9 (P3A0202-14) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
% Solids	67.7	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-5/S-10 (P3A0202-15) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
% Solids	78.8	1.00	% by Weight	1	NCA SOP	01/10/03	01/13/03	3010290	

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602567



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Hart Crowser  
Five Centerpoint Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

**Diesel and Heavy Range Hydrocarbons per NWLPH-DX Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3010209 - EPA 3550 Fuels**

**Blank (3010209-BLK1)**

Prepared & Analyzed: 01/09/03

Diesel Range Organics	ND	25.0	mg/kg							
Heavy Oil Range Hydrocarbons	ND	50.0	"							
Surr: 1-Chlorooctadecane	4.72		"	4.80		98.3	50-150			

**LCS (3010209-BS1)**

Prepared & Analyzed: 01/09/03

Diesel Range Organics	118	25.0	mg/kg	125		94.4	50-150			
Heavy Oil Range Hydrocarbons	76.7	50.0	"	75.0		102	50-150			
Surr: 1-Chlorooctadecane	4.86		"	4.80		101	50-150			

**Duplicate (3010209-DUP1)**

Source: P3A0162-01

Prepared: 01/09/03 Analyzed: 01/10/03

Diesel Range Organics	351	25.0	mg/kg dry		385			9.24	50	
Heavy Oil Range Hydrocarbons	451	50.0	"		441			2.24	50	
Surr: 1-Chlorooctadecane	6.23		"	5.49		113	50-150			

**Duplicate (3010209-DUP2)**

Source: P3A0162-02

Prepared & Analyzed: 01/09/03

Diesel Range Organics	ND	25.0	mg/kg dry		ND				50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND				50	
Surr: 1-Chlorooctadecane	5.60		"	5.44		103	50-150			

**Batch 3010252 - EPA 3550 Fuels**

**Blank (3010252-BLK1)**

Prepared & Analyzed: 01/10/03

Diesel Range Organics	ND	25.0	mg/kg							
Heavy Oil Range Hydrocarbons	ND	50.0	"							
Surr: 1-Chlorooctadecane	4.96		"	4.80		103	50-150			

**LCS (3010252-BS1)**

Prepared & Analyzed: 01/10/03

Diesel Range Organics	109	25.0	mg/kg	125		87.2	50-150			
Heavy Oil Range Hydrocarbons	59.8	50.0	"	75.0		79.7	50-150			
Surr: 1-Chlorooctadecane	5.55		"	4.80		116	50-150			

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602568



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Anchorage 4209 Denali Street, Anchorage, AK 99503  
907.334.9338 fax 907.334.9339

Reported:  
01/17/03 15:18

**Diesel and Heavy Range Hydrocarbons per NW1PH-Dx Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3010252 - EPA 3550 Fuels**

<b>Duplicate (3010252-DUP1)</b>		<b>Source: P3A0202-05</b>		<b>Prepared &amp; Analyzed: 01/10/03</b>						
Diesel Range Organics	ND	25.0	mg/kg dry		ND				50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND				50	
Surr: 1-Chlorooctadecane	5.77		"	5.65		102	50-150			
<b>Duplicate (3010252-DUP2)</b>		<b>Source: P3A0202-06</b>		<b>Prepared &amp; Analyzed: 01/10/03</b>						
Diesel Range Organics	ND	25.0	mg/kg dry		ND				50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND				50	
Surr: 1-Chlorooctadecane	6.40		"	5.36		119	50-150			

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POPT1S602569



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3010315 - EPA 3550

Blank (3010315-BLK1)

Prepared: 01/13/03 Analyzed: 01/14/03

Acenaphthene	ND	13.4	ug/kg
Acenaphthylene	ND	13.4	"
Anthracene	ND	13.4	"
Benzo (a) anthracene	ND	13.4	"
Benzo (a) pyrene	ND	13.4	"
Benzo (b) fluoranthene	ND	13.4	"
Benzo (ghi) perylene	ND	13.4	"
Benzo (k) fluoranthene	ND	13.4	"
Chrysene	ND	13.4	"
Dibenzo (a,h) anthracene	ND	13.4	"
Fluoranthene	ND	13.4	"
Fluorene	ND	13.4	"
Indeno (1,2,3-cd) pyrene	ND	13.4	"
Naphthalene	ND	13.4	"
Phenanthrene	ND	13.4	"
Pyrene	ND	13.4	"

Surr: Fluorene-d10	77.6	"	83.3	93.2	40-150
Surr: Pyrene-d10	80.8	"	83.3	97.0	40-150
Surr: Benzo (a) pyrene-d12	69.5	"	83.3	83.4	40-150

LCS (3010315-BS1)

Prepared: 01/13/03 Analyzed: 01/14/03

Acenaphthene	155	13.4	ug/kg	167	92.8	33-139
Benzo (a) pyrene	150	13.4	"	167	89.8	45-149
Pyrene	161	13.4	"	167	96.4	39-138
Surr: Fluorene-d10	75.3		"	83.3	90.4	40-150
Surr: Pyrene-d10	76.7		"	83.3	92.1	40-150
Surr: Benzo (a) pyrene-d12	70.3		"	83.3	84.4	40-150

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Lisa Domenighini, Project Manager

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Environmental Laboratory Network

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POPT1S602570



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

Polynuclear Aromatic Compounds per EPA 8270M-SIM Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Batch 3010315 - EPA 3550									
Matrix Spike (3010315-MS1)		Source: P3A0202-03		Prepared: 01/13/03		Analyzed: 01/15/03		R-01	
Acenaphthene	164	26.8	ug/kg dry	226	ND	66.6 33-139			
Benzo (a) pyrene	254	26.8	"	226	162	40.7 45-149			Q-0
Pyrene	294	26.8	"	226	268	11.5 39-138			Q-0
Surr: Fluorene-d10	81.0		"	113		71.7 40-150			
Surr: Pyrene-d10	89.2		"	113		78.9 40-150			
Surr: Benzo (a) pyrene-d12	86.1		"	113		76.2 40-150			
Matrix Spike Dup (3010315-MSD1)		Source: P3A0202-03		Prepared: 01/13/03		Analyzed: 01/15/03		R-05	
Acenaphthene	178	26.8	ug/kg dry	226	ND	72.8 33-139	8.19	60	
Benzo (a) pyrene	281	26.8	"	226	162	52.7 45-149	10.1	60	
Pyrene	382	26.8	"	226	268	50.4 39-138	26.0	60	
Surr: Fluorene-d10	84.6		"	113		74.9 40-150			
Surr: Pyrene-d10	91.5		"	113		81.0 40-150			
Surr: Benzo (a) pyrene-d12	88.2		"	113		78.1 40-150			

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POPT1S602571



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907.334.9338 fax 907.334.9339

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3010290 - Dry Weight

Duplicate (3010290-DUP1)		Source: P3A0162-02		Prepared: 01/10/03		Analyzed: 01/13/03				
% Solids	87.8	1.00 % by Weight			88.2			0.455	20	
Duplicate (3010290-DUP2)		Source: P3A0202-01		Prepared: 01/10/03		Analyzed: 01/13/03				
% Solids	93.1	1.00 % by Weight			93.0			0.107	20	

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POPT1S602572



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Hart Crowser  
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Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3010290 - Dry Weight

Duplicate (3010290-DUP1)

Source: P3A0162-02

Prepared: 01/10/03 Analyzed: 01/13/03

% Solids	87.8	1.00 % by Weight		88.2				0.455	20	
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Duplicate (3010290-DUP2)

Source: P3A0202-01

Prepared: 01/10/03 Analyzed: 01/13/03

% Solids	93.1	1.00 % by Weight		93.0				0.107	20	
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POPT1S602572



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:18

#### Notes and Definitions

- A-01 Detected hydrocarbons contain extraneous peaks that may be due to biogenic interference; however heavy oil is also present.
- A-02 Detected hydrocarbons are mainly due to overlap from the heavy/oil range; however, there is a trace of weathered diesel detected.
- D-15 Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.
- D-17 Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
- Q-01 The spike recovery, and/or RPD, for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
- R-05 Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
- wet Sample results reported on a wet weight basis (as received)
- RPD Relative Percent Difference

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602573

**H** P340202

# Sample Custody Record

DATE 1/8/03

PAGE 1 OF 2

**HART CROWSER**

Hart Crowser, Inc.  
Five Centerpointe Drive, Suite 240  
Lake Oswego, Oregon 97035

JOB NUMBER <u>15230-05</u> LAB NUMBER _____ PROJECT MANAGER <u>Herb Chung / Loui Fernandes</u> PROJECT NAME <u>Terminal 1 South Parcel 3</u> SAMPLED BY: <u>L. Fernandes</u>					<b>TESTING</b> TPN-Dx Diesel PAN'S 8270327										NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS			
LAB NO.	SAMPLE	TIME	STATION	MATRIX															
	A-4/3-1	13:40		Soil	X													2	Need Results by 1/17/03
	A-4/3-2	13:43															2		
	A-4/3-3	13:47				X											2		
	A-4/3-4	13:51															2		
	A-4/3-5	13:54															2		
	A-5/3-1	<del>14:00</del>	14:08			X											2		
	A-5/3-2	14:11															2		
	A-5/3-3	14:18															2		
	A-5/3-4	14:14															2		
	A-5/3-5	14:22				X											2		
	A-5/3-6	14:26															2		
	A-5/3-7	14:27															2		
RELINQUISHED BY		DATE	RECEIVED BY		DATE	TOTAL NUMBER OF CONTAINERS										24	METHOD OF SHIPMENT		
SIGNATURE			SIGNATURE			SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS											Deliver to NCA		
PRINTED NAME		TIME	PRINTED NAME		TIME														
COMPANY			COMPANY																
RELINQUISHED BY		DATE	RECEIVED BY		DATE	DISTRIBUTION:													
SIGNATURE			SIGNATURE			1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY													
PRINTED NAME		TIME	PRINTED NAME		TIME	2. RETURN PINK COPY TO PROJECT MANAGER													
COMPANY			COMPANY			3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT													
						4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER													

4.322  
10 effort

POPT1S602574

# Sample Custody Record

DATE 1/8/03

PAGE 2 OF 2



**HARTCROWSER**

Hart Crowser, Inc.  
Five Centerpoint Drive, Suite 240  
Lake Oswego, Oregon 97035

f3A0202

JOB NUMBER <u>15230-05</u> LAB NUMBER _____ PROJECT MANAGER <u>Herb Clough / Lewi Fernandes</u> PROJECT NAME <u>Terminal 1 South Parcel 3</u> SAMPLED BY: <u>L. Fernandes</u>					<b>TESTING</b> TPN# DX D1121 PMS 0210514 NO. OF CONTAINERS										OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS			
LAB NO.	SAMPLE	TIME	STATION	MATRIX														
	A-5/5-8	14:34		Sol	↓													
	A-5/5-9	14:38		↓	↓													
	A-5/5-10	14:43		↓	↓													
RELINQUISHED BY					DATE	RECEIVED BY					DATE	TOTAL NUMBER OF CONTAINERS					METHOD OF SHIPMENT	
SIGNATURE <u>Lewi Fernandes</u>					1/8/03	SIGNATURE <u>[Signature]</u>					1-8-03	6					Delivery to NCA	
PRINTED NAME <u>Lewi Fernandes</u>					TIME	PRINTED NAME <u>[Signature]</u>					TIME	SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS						
COMPANY <u>Hart Crowser</u>					15:40	COMPANY <u>NCA</u>					1542							
RELINQUISHED BY					DATE	RECEIVED BY					DATE	DISTRIBUTION:						
SIGNATURE						SIGNATURE						1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY						
PRINTED NAME					TIME	PRINTED NAME					TIME	2. RETURN PINK COPY TO PROJECT MANAGER						
COMPANY						COMPANY						3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT						
												4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER						

4,800  
[Signature]

POPT1S602575

# NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: Hart-Crowser

1. Please sign for receipt and opening of 1 cooler or 2 other \_\_\_\_\_

By (print) Sarah Passarelli (sign) [Signature]

2. Date samples received 118103 Date opened: Same ☒ or 1 1

3. Delivered by: ☐ NCA courier ☐ FedEx ☐ UPS ☒ Courier ☐ Client ☐ Other \_\_\_\_\_  
Airbill # if applicable \_\_\_\_\_ (Put copy of shipping papers in file)

4. There were 2 custody seals present, signed by \_\_\_\_\_ date 1 1

5. Were the custody seals unbroken and intact at the date and time of arrival? ☐ Yes ☐ No

6. Was ice used? ☒ yes ☐ no Type of ice: ☐ blue ice ☒ gel ice ☐ real ice  
Temperature (degrees C) 4.8 Raytek thermometer \_\_\_\_\_ Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ☐ Yes ☒ No

8. Were custody papers filled out properly (ink, signed, etc.)? ☒ Yes ☐ No  
If "no" please specify: \_\_\_\_\_

9. Was project identifiable from custody papers? ☒ Yes ☐ No  
Name of project T1 South Parcel 3 (if applicable)

10. Initial and date for unpacking: SP (initials) date 118103

11. Packing material: ☒ bubble wrap/bag ☐ styrofoam ☐ cardboard ☐ other \_\_\_\_\_

12. Were samples in bags? ☐ Yes ☒ No

13. Did all containers indicated on the COC arrive? ☒ Yes ☐ No  
If "no" please indicate which containers were absent \_\_\_\_\_

14. Were all containers unbroken and labels in good condition? ☒ Yes ☐ No  
If "no" please indicate which containers \_\_\_\_\_

15. Were all bottle labels complete (ID, date, time, signature, etc.)? ☒ Yes ☐ No  
Do the IDs, times, etc. agree with the COC? ☒ Yes ☐ No  
If "no" please indicate which containers \_\_\_\_\_

16. Are containers properly preserved for indicated analysis? ☒ Yes ☐ No

17. Is there adequate volume for the test(s) requested? ☒ Yes ☐ No

18. If voa vials were submitted, are they free of bubbles? ☒ N/A ☐ Yes ☐ No

19. Log-in phase: Date samples were logged in: 118103 Elm Project # P3A0202

20. Logged in by (print): Erica Dahan (sign) [Signature]

21. Was the project manager notified of status? (Use back of form as a record) ☐ Yes ☐ No



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907.334.9338 fax 907.334.9339

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:13

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
T-1	P3A0162-01	Soil	01/08/03 09:19	01/08/03 10:50
A-12/S-1	P3A0162-02	Soil	01/08/03 09:52	01/08/03 10:50
A-12/S-2	P3A0162-03	Soil	01/08/03 09:55	01/08/03 10:50
A-12/S-3	P3A0162-04	Soil	01/08/03 09:58	01/08/03 10:50
A-11/S-1	P3A0162-05	Soil	01/08/03 09:36	01/08/03 10:50
A-11/S-2	P3A0162-06	Soil	01/08/03 09:41	01/08/03 10:50
A-11/S-3	P3A0162-07	Soil	01/08/03 09:44	01/08/03 10:50

HART CROWSER, INC.

JAN 22 2003

Portland Office

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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North Creek Analytical, Inc.  
Environmental Laboratory Network

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POPT1S602577



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907.334.9338 fax 907.334.9339

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1, South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:13

### Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>T-1 (P3A0162-01) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	385	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/10/03	3010209	
Heavy Oil Range Hydrocarbons	441	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	116 %	50-150							
<b>A-12/S-1 (P3A0162-02) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/09/03	3010209	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	98.0 %	50-150							
<b>A-12/S-2 (P3A0162-03) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/09/03	3010209	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	95.5 %	50-150							
<b>A-12/S-3 (P3A0162-04) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/09/03	3010209	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	98.7 %	50-150							
<b>A-11/S-1 (P3A0162-05) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/10/03	3010209	
Heavy Oil Range Hydrocarbons	165	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	101 %	50-150							
<b>A-11/S-2 (P3A0162-06) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/09/03	3010209	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	105 %	50-150							

North Creek Analytical - Portland

*Lisa Domenighini*

Lisa Domenighini, Project Manager

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POPT1S602578



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Hart Crowser  
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Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Anchorage 3209 Denali Street, Anchorage, AK 99503  
907.334.9338 fax 907.334.9339

Reported:  
01/17/03 15:13

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
A-11/S-3 (P3A0162-07) Soil						Sampled: 01/08/03 Received: 01/08/03			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/09/03	01/09/03	3010209	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	109 %	50-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602579



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Reported:  
01/17/03 15:13

**TCLP Metals per EPA 1311/6000/7000 Series Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>T-1 (P3A0162-01) Soil</b>						Sampled: 01/08/03 Received: 01/08/03			
Arsenic	ND	0.100	mg/l	1	1311/6020	01/10/03	01/10/03	3010273	
Barium	0.258	0.100	"	"	"	"	"	"	
Cadmium	ND	0.100	"	"	"	"	"	"	
Chromium	ND	0.100	"	"	"	"	"	"	
Lead	ND	0.100	"	"	"	"	"	"	
Mercury	ND	0.000200	"	"	1311/7470A	01/09/03	01/09/03	3010218	
Selenium	ND	0.100	"	"	1311/6020	01/10/03	01/10/03	3010273	
Silver	ND	0.100	"	"	"	"	"	"	

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602580



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Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:13

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
A-12/S-2 (P3A0162-03) Soil						Sampled: 01/08/03 Received: 01/08/03			
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	01/13/03	01/15/03	3010315	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	52.9 %	40-150							
Surr: Pyrene-d10	54.6 %	40-150							
Surr: Benzo (a) pyrene-d12	52.3 %	40-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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Environmental Laboratory Network

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POPT1S602581



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:13

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>T-1 (P3A0162-01) Soil</b>					Sampled: 01/08/03 Received: 01/08/03				
% Solids	87.5	1.00 % by Weight		1	NCA SOP	01/08/03	01/09/03	3010201	
<b>A-12/S-1 (P3A0162-02) Soil</b>					Sampled: 01/08/03 Received: 01/08/03				
% Solids	88.2	1.00 % by Weight		1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-12/S-2 (P3A0162-03) Soil</b>					Sampled: 01/08/03 Received: 01/08/03				
% Solids	90.5	1.00 % by Weight		1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-12/S-3 (P3A0162-04) Soil</b>					Sampled: 01/08/03 Received: 01/08/03				
% Solids	91.8	1.00 % by Weight		1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-11/S-1 (P3A0162-05) Soil</b>					Sampled: 01/08/03 Received: 01/08/03				
% Solids	85.9	1.00 % by Weight		1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-11/S-2 (P3A0162-06) Soil</b>					Sampled: 01/08/03 Received: 01/08/03				
% Solids	94.1	1.00 % by Weight		1	NCA SOP	01/10/03	01/13/03	3010290	
<b>A-11/S-3 (P3A0162-07) Soil</b>					Sampled: 01/08/03 Received: 01/08/03				
% Solids	93.6	1.00 % by Weight		1	NCA SOP	01/10/03	01/13/03	3010290	

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602582



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Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:13

**Diesel and Heavy Range Hydrocarbons per NM EPH-D Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch 3010209 - EPA 3550 Fuels**

**Blank (3010209-BLK1)**

Prepared & Analyzed: 01/09/03

Diesel Range Organics	ND	25.0	mg/kg							
Heavy Oil Range Hydrocarbons	ND	50.0	"							
Surr: 1-Chlorooctadecane	4.72		"	4.80		98.3	50-150			

**LCS (3010209-BS1)**

Prepared & Analyzed: 01/09/03

Diesel Range Organics	118	25.0	mg/kg	125		94.4	50-150			
Heavy Oil Range Hydrocarbons	76.7	50.0	"	75.0		102	50-150			
Surr: 1-Chlorooctadecane	4.86		"	4.80		101	50-150			

**Duplicate (3010209-DUP1)**

Source: P3A0162-01

Prepared: 01/09/03 Analyzed: 01/10/03

Diesel Range Organics	351	25.0	mg/kg dry	385				9.24	50	
Heavy Oil Range Hydrocarbons	451	50.0	"	441				2.24	50	
Surr: 1-Chlorooctadecane	6.23		"	5.49		113	50-150			

**Duplicate (3010209-DUP2)**

Source: P3A0162-02

Prepared & Analyzed: 01/09/03

Diesel Range Organics	ND	25.0	mg/kg dry	ND					50	
Heavy Oil Range Hydrocarbons	ND	50.0	"	ND					50	
Surr: 1-Chlorooctadecane	5.60		"	5.44		103	50-150			

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602583



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Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:13

**ICLAP Metals per EPA 1311/6000/7000 Series Methods - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch 3010218 - EPA 1311/7470A**

**Blank (3010218-BLK1)**

Prepared & Analyzed: 01/09/03

Mercury ND 0.000200 mg/l

**LCS (3010218-BS1)**

Prepared & Analyzed: 01/09/03

Mercury 0.00518 0.000200 mg/l 0.00500 104 75-125

**Matrix Spike (3010218-MS1)**

Source: P3A0162-01

Prepared & Analyzed: 01/09/03

Mercury 0.00506 0.000200 mg/l 0.00500 ND 101 50-150

**Batch 3010273 - EPA 1311/3005**

**Blank (3010273-BLK1)**

Prepared & Analyzed: 01/10/03

Arsenic	ND	0.100	mg/l
Barium	ND	0.100	"
Cadmium	ND	0.100	"
Chromium	ND	0.100	"
Lead	ND	0.100	"
Selenium	ND	0.100	"
Silver	ND	0.100	"

**LCS (3010273-BS1)**

Prepared & Analyzed: 01/10/03

Arsenic	4.98	0.100	mg/l	5.00	99.6	75-125
Barium	11.0	0.100	"	10.0	110	75-125
Cadmium	1.15	0.100	"	1.00	115	75-125
Chromium	5.75	0.100	"	5.00	115	75-125
Lead	5.52	0.100	"	5.00	110	75-125
Selenium	2.43	0.100	"	2.00	122	75-125
Silver	1.15	0.100	"	1.00	115	75-125

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*Lisa Domenighini*

Lisa Domenighini, Project Manager

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:13

ICP Metals per EPA 1311/6000/7000 Series Methods - Quality Control

### North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD Limit	Notes
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#### Batch 3010273 - EPA 1311/3005

##### Matrix Spike (3010273-MS1)

Source: P3A0162-01

Prepared & Analyzed: 01/10/03

Arsenic	4.85	0.100	mg/l	5.00	ND	97.0	50-150	
Barium	10.9	0.100	"	10.0	0.258	106	50-150	
Cadmium	1.08	0.100	"	1.00	ND	108	50-150	
Chromium	5.49	0.100	"	5.00	ND	110	50-150	
Lead	5.39	0.100	"	5.00	ND	108	50-150	
Selenium	2.31	0.100	"	2.00	ND	116	50-150	
Silver	1.10	0.100	"	1.00	ND	110	50-150	

North Creek Analytical - Portland

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Project Manager: Levi Fernandes

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**Polynuclear Aromatic Compounds per EPA 8210M-SIM - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3010315 - EPA 3550**

**Blank (3010315-BLK1)**

Prepared: 01/13/03 Analyzed: 01/14/03

Acenaphthene	ND	13.4	ug/kg
Acenaphthylene	ND	13.4	"
Anthracene	ND	13.4	"
Benzo (a) anthracene	ND	13.4	"
Benzo (a) pyrene	ND	13.4	"
Benzo (b) fluoranthene	ND	13.4	"
Benzo (ghi) perylene	ND	13.4	"
Benzo (k) fluoranthene	ND	13.4	"
Chrysene	ND	13.4	"
Dibenzo (a,h) anthracene	ND	13.4	"
Fluoranthene	ND	13.4	"
Fluorene	ND	13.4	"
Indeno (1,2,3-cd) pyrene	ND	13.4	"
Naphthalene	ND	13.4	"
Phenanthrene	ND	13.4	"
Pyrene	ND	13.4	"

Surr: Fluorene-d10	77.6	"	83.3	93.2	40-150
Surr: Pyrene-d10	80.8	"	83.3	97.0	40-150
Surr: Benzo (a) pyrene-d12	69.5	"	83.3	83.4	40-150

**LCS (3010315-BS1)**

Prepared: 01/13/03 Analyzed: 01/14/03

Acenaphthene	155	13.4	ug/kg	167	92.8	33-139
Benzo (a) pyrene	150	13.4	"	167	89.8	45-149
Pyrene	161	13.4	"	167	96.4	39-138
Surr: Fluorene-d10	75.3		"	83.3	90.4	40-150
Surr: Pyrene-d10	76.7		"	83.3	92.1	40-150
Surr: Benzo (a) pyrene-d12	70.3		"	83.3	84.4	40-150

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Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/17/03 15:13

**Polynuclear Aromatic Compounds per EPA 8270M-SIM (Quality Control)**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3010315 - EPA 3550**

Matrix Spike (3010315-MS1)	Source: P3A0202-03			Prepared: 01/13/03		Analyzed: 01/15/03		R-05		
Acenaphthene	164	26.8	ug/kg dry	226	ND	66.6	33-139			
Benzo (a) pyrene	254	26.8	"	226	162	40.7	45-149			Q-01
Pyrene	294	26.8	"	226	268	11.5	39-138			Q-01
Surr: Fluorene-d10	81.0		"	113		71.7	40-150			
Surr: Pyrene-d10	89.2		"	113		78.9	40-150			
Surr: Benzo (a) pyrene-d12	86.1		"	113		76.2	40-150			

Matrix Spike Dup (3010315-MSD1)	Source: P3A0202-03			Prepared: 01/13/03		Analyzed: 01/15/03		R-05		
Acenaphthene	178	26.8	ug/kg dry	226	ND	72.8	33-139	8.19	60	
Benzo (a) pyrene	281	26.8	"	226	162	52.7	45-149	10.1	60	
Pyrene	382	26.8	"	226	268	50.4	39-138	26.0	60	
Surr: Fluorene-d10	84.6		"	113		74.9	40-150			
Surr: Pyrene-d10	91.5		"	113		81.0	40-150			
Surr: Benzo (a) pyrene-d12	88.2		"	113		78.1	40-150			

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Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

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Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3010201 - Dry Weight

Duplicate (3010201-DUP1) Source: P3A0111-01 Prepared: 01/08/03 Analyzed: 01/09/03

% Solids	91.6	1.00 % by Weight		91.7				0.109	20	
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Batch 3010290 - Dry Weight

Duplicate (3010290-DUP1) Source: P3A0162-02 Prepared: 01/10/03 Analyzed: 01/13/03

% Solids	87.8	1.00 % by Weight		88.2				0.455	20	
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Duplicate (3010290-DUP2) Source: P3A0202-01 Prepared: 01/10/03 Analyzed: 01/13/03

% Solids	93.1	1.00 % by Weight		93.0				0.107	20	
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POPT1S602588



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Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

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Reported:  
01/17/03 15:13

#### Notes and Definitions

- Q-01 The spike recovery, and/or RPD, for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
- R-05 Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
- wet Sample results reported on a wet weight basis (as received)
- RPD Relative Percent Difference

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Hart Crowser  
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Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/08/03 12:15

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
A9/S-1	P3A0015-01	Soil	01/02/03 08:24	01/02/03 09:30
A9/S-2	P3A0015-02	Soil	01/02/03 08:29	01/02/03 09:30
A9/S-3	P3A0015-03	Soil	01/02/03 08:31	01/02/03 09:30
A9/S-4	P3A0015-04	Soil	01/02/03 08:34	01/02/03 09:30
A9/S-5	P3A0015-05	Soil	01/02/03 08:41	01/02/03 09:30
A9/S-6	P3A0015-06	Soil	01/02/03 08:37	01/02/03 09:30

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Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/08/03 12:15

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A9/S-1 (P3A0015-01) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
Diesel Range Organics	74.3	25.0	mg/kg dry	1	NWTPH-Dx	01/06/03	01/06/03	3010084	D-17
Heavy Oil Range Hydrocarbons	182	50.0	"	"	"	"	"	"	A-01
Surr: 1-Chlorooctadecane	120 %	50-150							
<b>A9/S-2 (P3A0015-02) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
Diesel Range Organics	545	250	mg/kg dry	10	NWTPH-Dx	01/06/03	01/06/03	3010084	D-17
Heavy Oil Range Hydrocarbons	2100	500	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	110 %	50-150							
<b>A9/S-3 (P3A0015-03) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
Diesel Range Organics	ND	125	mg/kg dry	5	NWTPH-Dx	01/06/03	01/06/03	3010084	R-05
Heavy Oil Range Hydrocarbons	311	250	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	107 %	50-150							
<b>A9/S-4 (P3A0015-04) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/06/03	01/06/03	3010084	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	94.6 %	50-150							
<b>A9/S-5 (P3A0015-05) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	01/06/03	01/06/03	3010084	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	95.6 %	50-150							
<b>A9/S-6 (P3A0015-06) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
Diesel Range Organics	ND	125	mg/kg dry	5	NWTPH-Dx	01/06/03	01/06/03	3010084	R-05
Heavy Oil Range Hydrocarbons	378	250	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	107 %	50-150							

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Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes


Reported:  
01/08/03 12:15

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A9/S-1 (P3A0015-01) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
% Solids	82.6	1.00	% by Weight	1	NCA SOP	01/06/03	01/07/03	3010117	
<b>A9/S-2 (P3A0015-02) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
% Solids	82.1	1.00	% by Weight	1	NCA SOP	01/06/03	01/07/03	3010117	
<b>A9/S-3 (P3A0015-03) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
% Solids	81.5	1.00	% by Weight	1	NCA SOP	01/06/03	01/07/03	3010117	
<b>A9/S-4 (P3A0015-04) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
% Solids	92.7	1.00	% by Weight	1	NCA SOP	01/06/03	01/07/03	3010117	
<b>A9/S-5 (P3A0015-05) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
% Solids	91.1	1.00	% by Weight	1	NCA SOP	01/06/03	01/07/03	3010117	
<b>A9/S-6 (P3A0015-06) Soil</b> <span style="float: right;">Sampled: 01/02/03 Received: 01/02/03</span>									
% Solids	82.1	1.00	% by Weight	1	NCA SOP	01/06/03	01/07/03	3010117	

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Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/08/03 12:15

**Diesel and Heavy Range Hydrocarbons per NW LPH-Dx Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3010084 - EPA 3550 Fuels**

**Blank (3010084-BLK1)**

Prepared & Analyzed: 01/06/03

Diesel Range Organics	ND	25.0	mg/kg						
Heavy Oil Range Hydrocarbons	ND	50.0	"						
Surr: 1-Chlorooctadecane	5.10		"	4.80		106	50-150		

**LCS (3010084-BS1)**

Prepared & Analyzed: 01/06/03

Diesel Range Organics	118	25.0	mg/kg	125		94.4	50-150		
Heavy Oil Range Hydrocarbons	67.9	50.0	"	75.0		90.5	50-150		
Surr: 1-Chlorooctadecane	4.91		"	4.80		102	50-150		

**Duplicate (3010084-DUP1)**

Source: P3A0015-01

Prepared & Analyzed: 01/06/03

Diesel Range Organics	109	25.0	mg/kg dry		74.3			37.9	50
Heavy Oil Range Hydrocarbons	263	50.0	"		182			36.4	50
Surr: 1-Chlorooctadecane	7.27		"	5.81		125	50-150		

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Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/08/03 12:15

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch 3010117 - Dry Weight

Duplicate (3010117-DUP1)

Source: P3A0015-04

Prepared: 01/06/03 Analyzed: 01/07/03

% Solids	92.8	1.00 % by Weight		92.7		0.108	20
----------	------	------------------	--	------	--	-------	----

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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POPT1S602595



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541.383.9310 fax 541.382.7588  
Anchorage 3205 Denali Street, Anchorage, AK 99503  
907.334.9338 fax 907.334.9339

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/08/03 12:15

#### Notes and Definitions

- A-01 Detected hydrocarbons contain extraneous peaks that may be due to biogenic interference; however heavy oil is also present.
- D-17 Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
- R-05 Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
- wet Sample results reported on a wet weight basis (as received)
- RPD Relative Percent Difference

North Creek Analytical - Portland

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POPT1S602596



DATE 1/2/03

PAGE 1 OF 1

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1.8°C

POP1S602597



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/06/03 15:43

#### ANALYTICAL REPORT FOR SAMPLES

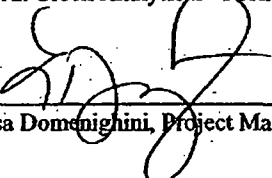
Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Z-1	P2L0770-01	Soil	12/20/02 07:45	12/23/02 11:12

HART CROWSER, INC.

JAN 8 2003

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North Creek Analytical - Portland

  
Lisa Domenighini, Project Manager

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/06/03 15:43

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>Z-1 (P2L0770-01) Soil</b>						Sampled: 12/20/02 Received: 12/23/02			
Diesel Range Organics	128	125	mg/kg dry	5	NWTPH-Dx	12/31/02	12/31/02	2121011	
Heavy Oil Range Hydrocarbons	395	250	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	120 %	50-150							

North Creek Analytical - Portland

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Hart Crowser  
 Five Centerpointe Drive  
 Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
 Project Number: 15230-05  
 Project Manager: Levi Fernandes

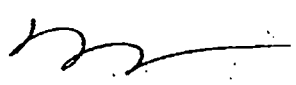
Reported:  
 01/06/03 15:43

**TCLP Metals per EPA 1311/6000/7000 Series Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>Z-1 (P2L0770-01) Soil</b>						Sampled: 12/20/02 Received: 12/23/02			
Arsenic	ND	0.100	mg/l	1	1311/6020	12/31/02	12/31/02	2121027	
Barium	1.90	0.100	"	"	"	"	"	"	
Cadmium	ND	0.100	"	"	"	"	"	"	
Chromium	ND	0.100	"	"	"	"	"	"	
Lead	0.976	0.100	"	"	"	"	"	"	
Mercury	ND	0.000200	"	"	1311/7470A	01/02/03	01/02/03	2121040	
Selenium	ND	0.100	"	"	1311/6020	12/31/02	12/31/02	2121027	
Silver	ND	0.100	"	"	"	"	"	"	

North Creek Analytical - Portland

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POPT1S602600



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/06/03 15:43

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>Z-1 (P2L0770-01) Soil</b>					Sampled: 12/20/02 Received: 12/23/02				
% Solids	88.2	1.00 % by Weight	1		NCA SOP	12/30/02	12/31/02	2120976	

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602601



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Hart Crowser  
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 Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
 Project Number: 15230-05  
 Project Manager: Levi Fernandes

Reported:  
 01/06/03 15:43

**Diesel and Heavy Range Hydrocarbons per NW TPH-Dx Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC Limits	RPD	RPD Limit	Notes
<b>Batch 2121011 - EPA 3550 Fuels</b>									
<b>Blank (2121011-BLK1)</b>				Prepared & Analyzed: 12/31/02					
Diesel Range Organics	ND	25.0	mg/kg						
Heavy Oil Range Hydrocarbons	ND	50.0	"						
Surr: 1-Chlorooctadecane	3.97		"	4.80		82.7 50-150			
<b>LCS (2121011-BS1)</b>				Prepared & Analyzed: 12/31/02					
Diesel Range Organics	114	25.0	mg/kg	125		91.2 50-150			
Heavy Oil Range Hydrocarbons	83.6	50.0	"	75.0		111 50-150			
Surr: 1-Chlorooctadecane	3.75		"	4.80		78.1 50-150			
<b>Duplicate (2121011-DUP1)</b>				Source: P2L0732-01		Prepared & Analyzed: 12/31/02			
Diesel Range Organics	51.0	25.0	mg/kg dry		66.1		25.8	50	
Heavy Oil Range Hydrocarbons	115	50.0	"		98.1		15.9	50	
Surr: 1-Chlorooctadecane	5.40		"	4.80		112 50-150			
<b>Duplicate (2121011-DUP2)</b>				Source: P2L0732-02		Prepared & Analyzed: 12/31/02			
Diesel Range Organics	ND	25.0	mg/kg dry		ND			50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND			50	
Surr: 1-Chlorooctadecane	3.64		"	4.80		75.8 50-150			

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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POPT1S602602



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/06/03 15:43

**ICP Metals per EPA 1311/6000/7000 Series Methods - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 2121027 - EPA 1311/3005**

**Blank (2121027-BLK1)**

Prepared & Analyzed: 12/31/02

Arsenic	ND	0.100	mg/l							
Barium	ND	0.100	"							
Cadmium	ND	0.100	"							
Chromium	ND	0.100	"							
Lead	ND	0.100	"							
Selenium	ND	0.100	"							
Silver	ND	0.100	"							

**LCS (2121027-BS1)**

Prepared & Analyzed: 12/31/02

Arsenic	4.97	0.100	mg/l	5.00		99.4	75-125			
Barium	11.2	0.100	"	10.0		112	75-125			
Cadmium	1.15	0.100	"	1.00		115	75-125			
Chromium	5.70	0.100	"	5.00		114	75-125			
Lead	5.81	0.100	"	5.00		116	75-125			
Selenium	2.23	0.100	"	2.00		112	75-125			
Silver	1.14	0.100	"	1.00		114	75-125			

**Matrix Spike (2121027-MS1)**

Source: P2L0560-01

Prepared & Analyzed: 12/31/02

Arsenic	5.58	0.100	mg/l	5.00	ND	112	50-150			
Barium	12.5	0.100	"	10.0	0.265	122	50-150			
Cadmium	1.27	0.100	"	1.00	ND	127	50-150			
Chromium	6.29	0.100	"	5.00	ND	126	50-150			
Lead	6.34	0.100	"	5.00	ND	127	50-150			
Selenium	2.36	0.100	"	2.00	ND	118	50-150			
Silver	1.27	0.100	"	1.00	ND	127	50-150			

**Batch 2121040 - EPA 1311/7470A**

**Blank (2121040-BLK1)**

Prepared & Analyzed: 01/02/03

Mercury	ND	0.000200	mg/l							
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Lisa Domenighini, Project Manager

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Environmental Laboratory Network

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POPT1S602603



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Anchorage 3209 Denaa Street, Anchorage, AK 99503  
907.334.9338 fax 907.334.9339

Reported:  
01/06/03 15:43

ICP Metals per EPA 1311/6000/7000 Series Methods - Quality Control

### North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD Limit	Notes
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#### Batch 2121040 - EPA 1311/7470A

##### LCS (2121040-BS1)

Prepared & Analyzed: 01/02/03

Mercury	0.00505	0.000200	mg/l	0.00500		101	75-125	
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##### Matrix Spike (2121040-MS1)

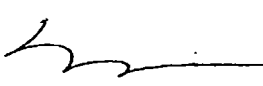
Source: P2L0770-01

Prepared & Analyzed: 01/02/03

Mercury	0.00485	0.000200	mg/l	0.00500	ND	96.5	50-150	
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Environmental Laboratory Network

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POPT1S602604



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Anchorage 3209 Denali Street, Anchorage, AK 99503  
907.334.9338 fax 907.334.9339

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/06/03 15:43

**Percent Dry Weight (Solids) per Standard Methods - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Batch 2120976 - Dry Weight									
Duplicate (2120976-DUP1)		Source: P2L0700-01			Prepared: 12/30/02 Analyzed: 12/31/02				
% Solids	70.5	1.00 % by Weight			70.4		0.142	20	
Duplicate (2120976-DUP2)		Source: P2L0758-01			Prepared: 12/30/02 Analyzed: 12/31/02				
% Solids	65.9	1.00 % by Weight			65.2		1.07	20	

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Environmental Laboratory Network

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POPT1S602605



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
01/06/03 15:43

#### Notes and Definitions

DET Analyte DETECTED  
ND Analyte NOT DETECTED at or above the reporting limit  
NR Not Reported  
dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.  
wet Sample results reported on a wet weight basis (as received)  
RPD Relative Percent Difference

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602606



DATE 12/23/02

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Five Centerpointe Drive, Suite 240  
Lake Oswego, Oregon 97035

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Herb Clough

Reported:  
12/26/02 15:48

### ANALYTICAL REPORT FOR SAMPLES

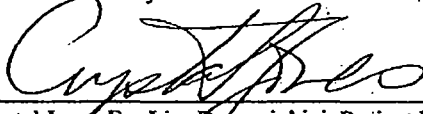
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A-2/S-1	P2L0567-02	Soil	12/17/02 12:00	12/17/02 14:15

HART CROWSER, INC.

DEC 30 2002

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North Creek Analytical - Portland

  
Crystal Jones For Lisa Domenighini, Project Manager

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POPT1S602608



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Herb Clough

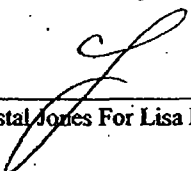
Reported:  
12/26/02 15:48

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>A-1/S-1 (P2L0567-01) Soil</b>						Sampled: 12/05/02 Received: 12/17/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	12/18/02	12/18/02	2120663	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	86.6 %	50-150							
<b>A-2/S-1 (P2L0567-02) Soil</b>						Sampled: 12/17/02 Received: 12/17/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	12/19/02	12/20/02	2120735	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	106 %	50-150							

North Creek Analytical - Portland

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Crystal Jones For Lisa Domenighini, Project Manager

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Environmental Laboratory Network

Page 2 of

POPT1S602609



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541.383.9310 fax 541.382.7588  
Anchorage 3209 Denali Street, Anchorage, AK 99503  
907.334.9338 fax 907.334.9339

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Herb Clough

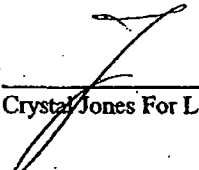
Reported:  
12/26/02 15:48

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
A-1/S-1 (P2L0567-01) Soil						Sampled: 12/05/02 Received: 12/17/02			
% Solids	86.0	1.00	% by Weight	1	NCA SOP	12/17/02	12/18/02	2120646	
A-2/S-1 (P2L0567-02) Soil						Sampled: 12/17/02 Received: 12/17/02			
% Solids	90.1	1.00	% by Weight	1	NCA SOP	12/17/02	12/18/02	2120646	

North Creek Analytical - Portland

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Environmental Laboratory Network

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POPT1S602610



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Herb Clough

Reported:  
12/26/02 15:48

**Diesel and Heavy Range Hydrocarbons per NWFPID Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch 2120663 - EPA 3550 Fuels**

**Blank (2120663-BLK1)**

Prepared & Analyzed: 12/18/02

Diesel Range Organics	ND	25.0	mg/kg							
Heavy Oil Range Hydrocarbons	ND	50.0	"							
Surr: 1-Chlorooctadecane	3.94		"	4.80		82.1	50-150			

**LCS (2120663-BS1)**

Prepared & Analyzed: 12/18/02

Diesel Range Organics	106	25.0	mg/kg	125		84.8	50-150			
Heavy Oil Range Hydrocarbons	77.2	50.0	"	75.0		103	50-150			
Surr: 1-Chlorooctadecane	4.03		"	4.80		84.0	50-150			

**Duplicate (2120663-DUP1)**

Source: P2L0226-05

Prepared & Analyzed: 12/18/02

Diesel Range Organics	ND	25.0	mg/kg dry		ND				50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND				50	
Surr: 1-Chlorooctadecane	5.23		"	5.15		102	50-150			

**Duplicate (2120663-DUP2)**

Source: P2L0226-11

Prepared & Analyzed: 12/18/02

Diesel Range Organics	ND	25.0	mg/kg dry		ND				50	
Heavy Oil Range Hydrocarbons	226	50.0	"		270			17.7	50	
Surr: 1-Chlorooctadecane	5.07		"	5.96		85.1	50-150			

**Batch 2120735 - EPA 3550 Fuels**

**Blank (2120735-BLK1)**

Prepared: 12/19/02 Analyzed: 12/20/02

Diesel Range Organics	ND	25.0	mg/kg							
Heavy Oil Range Hydrocarbons	ND	50.0	"							
Surr: 1-Chlorooctadecane	4.74		"	4.80		98.7	50-150			

**LCS (2120735-BS1)**

Prepared: 12/19/02 Analyzed: 12/20/02

Diesel Range Organics	105	25.0	mg/kg	125		84.0	50-150			
Heavy Oil Range Hydrocarbons	46.1	45.0	"	75.0		61.5	50-150			
Surr: 1-Chlorooctadecane	5.29		"	4.80		110	50-150			

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Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Herb Clough

Reported:  
12/26/02 15:48

**Diesel and Heavy Range Hydrocarbons per NW TPH-Dx Method - Quality Control**

**North Creek Analytical - Portland**

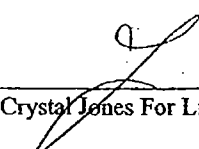
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD Limit	Notes
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**Batch 2120735 - EPA 3550 Fuels**

<b>Duplicate (2120735-DUP1)</b>		<b>Source: P2L0555-11</b>		<b>Prepared: 12/19/02 Analyzed: 12/20/02</b>			
Diesel Range Organics	ND	25.0	mg/kg dry	ND		50	Q-16
Heavy Oil Range Hydrocarbons	ND	50.0	"	67.6		50	Q-16
<i>Surr: 1-Chlorooctadecane</i>	<i>6.12</i>		<i>"</i>	<i>5.80</i>	<i>106 50-150</i>		
<b>Duplicate (2120735-DUP2)</b>		<b>Source: P2L0555-13</b>		<b>Prepared: 12/19/02 Analyzed: 12/20/02</b>			
Diesel Range Organics	ND	25.0	mg/kg dry	ND		50	
Heavy Oil Range Hydrocarbons	ND	50.0	"	ND		50	
<i>Surr: 1-Chlorooctadecane</i>	<i>5.91</i>		<i>"</i>	<i>5.73</i>	<i>103 50-150</i>		

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POPT1S602612



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Hart Crowser  
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Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Herb Clough

Reported:  
12/26/02 15:48

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch 2120646 - Dry Weight

Duplicate (2120646-DUP1)

Source: P2L0226-05

Prepared: 12/17/02 Analyzed: 12/18/02

% Solids	93.3	1.00 % by Weight	93.2	0.107	20
----------	------	------------------	------	-------	----

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POPT1S602613



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Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-05  
Project Manager: Herb Clough

Reported:  
12/26/02 15:48

### Notes and Definitions

Q-16 RPD is not applicable for analyte concentrations less than 5 times the MRL.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.

wet Sample results reported on a wet weight basis (as received)

RPD Relative Percent Difference

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POPT1S602614



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 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

# CHAIN OF CUSTODY REPORT

Work Order #: **P2L0567**

CLIENT: <b>HAIR CROWSON</b> REPORT TO: <b>HERB CLOUGH</b> ADDRESS: <b>5 CENTERPOINTE STE 240</b> <b>LAKE OSWEGO, OR 97035</b> PHONE: <b>503-620-7284</b> FAX: <b>-6918</b>		INVOICE TO:  P.O. NUMBER:		<b>TURNAROUND REQUEST In Business Days*</b> Organic & Inorganic Analyses <div style="display: flex; justify-content: space-around;"> <span>10</span><span>7</span><span>5</span><span>4</span><span>3</span><span>2</span><span>1</span><span>&lt;1</span> </div> STD. Petroleum Hydrocarbon Analyses <div style="display: flex; justify-content: space-around;"> <span>5</span><span>4</span><span>3</span><span>2</span><span>1</span><span>&lt;1</span> </div> STD. Please Specify <div style="border: 1px solid black; padding: 2px; display: inline-block;"> <b>OTHER</b> <b>STD</b> </div> <p><small>*Turnaround Requests less than standard may incur Rush Charges.</small></p>										
PROJECT NAME: <b>T1 SOUTH PARCEL 3</b> PROJECT NUMBER: <b>15230-05</b> SAMPLED BY: <b>K. KROEBER</b>		REQUESTED ANALYSES												
CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	<div style="writing-mode: vertical-rl; transform: rotate(180deg);">           NON-THINX         </div>									MATRIX (W. S. O.)	# OF CONT.	COMMENTS	NCA WO ID
1. <b>A-1/S-1</b>	<b>12/5/02 1300</b>	<b>X</b>									<b>S</b>	<b>2</b>		
2. <b>A-2/S-1</b>	<b>12/11/02 1200</b>	<b>X</b>									<b>S</b>	<b>2</b>		
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														
11.														
12.														
13.														
14.														
15.														

RELINQUISHED BY: <b>KETTH KROEBER</b> FIRM: <b>HC</b> PRINT NAME:	DATE: <b>12/17/02</b> TIME:	RECEIVED BY: <b>[Signature]</b> FIRM: <b>NCA</b> PRINT NAME:	DATE: <b>12-17-02</b> TIME: <b>1415</b>
RELINQUISHED BY: PRINT NAME: FIRM:	DATE: TIME:	RECEIVED BY: PRINT NAME: FIRM:	DATE: TIME:

ADDITIONAL REMARKS: **CC 12/17/02** **TEMP 5.7**

COC # \_\_\_\_\_

POPT1S602615



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Hart Crowser  
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Lake Oswego, OR 97035

Project: POP-T-I Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Anchorage 3209 Denali Street, Anchorage, AK 99503  
907.334.9338 fax 907.334.9339

Reported:  
12/13/02 17:13

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Stock 1	P2L0336-01	Soil	12/11/02 09:16	12/11/02 12:55
Stock 2	P2L0336-02	Soil	12/11/02 09:33	12/11/02 12:55
Stock 3	P2L0336-03	Soil	12/11/02 10:48	12/11/02 12:55
Stock 4	P2L0336-04	Soil	12/11/02 10:05	12/11/02 12:55
Stock 5	P2L0336-05	Soil	12/11/02 10:54	12/11/02 12:55
Stock 6	P2L0336-06	Soil	12/11/02 11:48	12/11/02 12:55
Stock 7	P2L0336-07	Soil	12/11/02 11:09	12/11/02 12:55
Stock 8	P2L0336-08	Soil	12/11/02 11:27	12/11/02 12:55

HART CROWSER, INC.

DEC 16 2002

Portland Office

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Lisa Domenighini, Project Manager

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POPT1S602616



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Project: POP-T-1 Parcel 5  
Project Number: 15230-05  
Project Manager: Levi Fernandes

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Reported:  
12/13/02 17:13

### Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>Stock 1 (P2L0336-01) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
Diesel Range Organics	133	25.0	mg/kg dry	1	NWTPH-Dx	12/11/02	12/13/02	2120410	A-01
Heavy Oil Range Hydrocarbons	358	50.0	"	"	"	"	"	"	"
Surr: 1-Chlorooctadecane	116 %	50-150							
<b>Stock 2 (P2L0336-02) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
Diesel Range Organics	187	25.0	mg/kg dry	1	NWTPH-Dx	12/11/02	12/13/02	2120410	A-01
Heavy Oil Range Hydrocarbons	430	50.0	"	"	"	"	"	"	"
Surr: 1-Chlorooctadecane	118 %	50-150							
<b>Stock 3 (P2L0336-03) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
Diesel Range Organics	190	25.0	mg/kg dry	1	NWTPH-Dx	12/11/02	12/12/02	2120410	A-01
Heavy Oil Range Hydrocarbons	345	50.0	"	"	"	"	"	"	"
Surr: 1-Chlorooctadecane	113 %	50-150							
<b>Stock 4 (P2L0336-04) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
Diesel Range Organics	94.7	25.0	mg/kg dry	1	NWTPH-Dx	12/11/02	12/12/02	2120410	A-01
Heavy Oil Range Hydrocarbons	300	50.0	"	"	"	"	"	"	"
Surr: 1-Chlorooctadecane	105 %	50-150							
<b>Stock 5 (P2L0336-05) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
Diesel Range Organics	233	25.0	mg/kg dry	1	NWTPH-Dx	12/11/02	12/13/02	2120410	A-01
Heavy Oil Range Hydrocarbons	833	50.0	"	"	"	"	"	"	"
Surr: 1-Chlorooctadecane	77.8 %	50-150							
<b>Stock 6 (P2L0336-06) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
Diesel Range Organics	532	25.0	mg/kg dry	1	NWTPH-Dx	12/11/02	12/12/02	2120410	D-11
Heavy Oil Range Hydrocarbons	527	50.0	"	"	"	"	"	"	"
Surr: 1-Chlorooctadecane	115 %	50-150							

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*Lisa Domenighini*

Lisa Domenighini, Project Manager

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POPT1S602617



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Project: POP-T-1 Parcel 5  
Project Number: 15230-05  
Project Manager: Levi Fernandes

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Reported:  
12/13/02 17:13

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>Stock 7 (P2L0336-07) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
Diesel Range Organics	164	25.0	mg/kg dry	1	NWTPH-Dx	12/11/02	12/13/02	2120410	A-01
Heavy Oil Range Hydrocarbons	504	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	82.7 %	50-150							
<b>Stock 8 (P2L0336-08) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	12/11/02	12/12/02	2120410	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	109 %	50-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602618



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 5  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
12/13/02 17:13

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Note
<b>Stock 1 (P2L0336-01) Soil</b>						Sampled: 12/11/02 Received: 12/11/02		R-0	
Acenaphthene	ND	67.0	ug/kg dry	5	EPA 8270m	12/11/02	12/12/02	2120412	
Acenaphthylene	ND	67.0	"	"	"	"	"	"	
Anthracene	ND	67.0	"	"	"	"	"	"	
Benzo (a) anthracene	157	67.0	"	"	"	"	"	"	
Benzo (a) pyrene	173	67.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	158	67.0	"	"	"	"	"	"	
Benzo (ghi) perylene	148	67.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	127	67.0	"	"	"	"	"	"	
Chrysene	193	67.0	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	67.0	"	"	"	"	"	"	
Fluoranthene	339	67.0	"	"	"	"	"	"	
Fluorene	ND	67.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	108	67.0	"	"	"	"	"	"	
Naphthalene	ND	67.0	"	"	"	"	"	"	
Phenanthrene	266	67.0	"	"	"	"	"	"	
Pyrene	369	67.0	"	"	"	"	"	"	
Surr: Fluorene-d10	50.8 %	40-150							
Surr: Pyrene-d10	50.8 %	40-150							
Surr: Benzo (a) pyrene-d12	51.3 %	40-150							

<b>Stock 2 (P2L0336-02) Soil</b>						Sampled: 12/11/02 Received: 12/11/02		R-0	
Acenaphthene	ND	67.0	ug/kg dry	5	EPA 8270m	12/11/02	12/12/02	2120412	
Acenaphthylene	ND	67.0	"	"	"	"	"	"	
Anthracene	73.3	67.0	"	"	"	"	"	"	
Benzo (a) anthracene	181	67.0	"	"	"	"	"	"	
Benzo (a) pyrene	207	67.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	156	67.0	"	"	"	"	"	"	
Benzo (ghi) perylene	166	67.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	147	67.0	"	"	"	"	"	"	
Chrysene	222	67.0	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	67.0	"	"	"	"	"	"	
Fluoranthene	401	67.0	"	"	"	"	"	"	
Fluorene	ND	67.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	119	67.0	"	"	"	"	"	"	
Naphthalene	ND	67.0	"	"	"	"	"	"	
Phenanthrene	360	67.0	"	"	"	"	"	"	
Pyrene	450	67.0	"	"	"	"	"	"	
Surr: Fluorene-d10	87.2 %	40-150							

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POPT1S602619



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907.334.9338 fax 907.334.9339

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
12/13/02 17:13

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>Stock 2 (P2L0336-02) Soil</b>						Sampled: 12/11/02 Received: 12/11/02		<b>R-05</b>	
Surr: Pyrene-d10	94.8 %	40-150							
Surr: Benzo (a) pyrene-d12	95.6 %	40-150							
<b>Stock 3 (P2L0336-03) Soil</b>						Sampled: 12/11/02 Received: 12/11/02		<b>R-05</b>	
Acenaphthene	ND	67.0	ug/kg dry	5	EPA 8270m	12/11/02	12/12/02	2120412	
Acenaphthylene	ND	67.0	"	"	"	"	"	"	
Anthracene	ND	67.0	"	"	"	"	"	"	
Benzo (a) anthracene	76.4	67.0	"	"	"	"	"	"	
Benzo (a) pyrene	113	67.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	108	67.0	"	"	"	"	"	"	
Benzo (ghi) perylene	115	67.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	73.0	67.0	"	"	"	"	"	"	
Chrysene	109	67.0	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	67.0	"	"	"	"	"	"	
Fluoranthene	222	67.0	"	"	"	"	"	"	
Fluorene	ND	67.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	77.7	67.0	"	"	"	"	"	"	
Naphthalene	ND	67.0	"	"	"	"	"	"	
Phenanthrene	155	67.0	"	"	"	"	"	"	
Pyrene	253	67.0	"	"	"	"	"	"	
Surr: Fluorene-d10	91.2 %	40-150							
Surr: Pyrene-d10	96.0 %	40-150							
Surr: Benzo (a) pyrene-d12	91.6 %	40-150							
<b>Stock 4 (P2L0336-04) Soil</b>						Sampled: 12/11/02 Received: 12/11/02		<b>R-05</b>	
Acenaphthene	ND	67.0	ug/kg dry	5	EPA 8270m	12/11/02	12/12/02	2120412	
Acenaphthylene	ND	67.0	"	"	"	"	"	"	
Anthracene	ND	67.0	"	"	"	"	"	"	
Benzo (a) anthracene	87.8	67.0	"	"	"	"	"	"	
Benzo (a) pyrene	103	67.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	92.3	67.0	"	"	"	"	"	"	
Benzo (ghi) perylene	113	67.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	80.3	67.0	"	"	"	"	"	"	
Chrysene	117	67.0	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	67.0	"	"	"	"	"	"	
Fluoranthene	196	67.0	"	"	"	"	"	"	
Fluorene	ND	67.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	72.8	67.0	"	"	"	"	"	"	

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Lisa Domenighini, Project Manager

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POPT1S602620



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
12/13/02 17:13

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>Stock 4 (P2L0336-04) Soil</b>					Sampled: 12/11/02 Received: 12/11/02				<b>R-05</b>
Naphthalene	ND	67.0	ug/kg dry	5	EPA 8270m	12/11/02	12/12/02	2120412	
Phenanthrene	154	67.0	"	"	"	"	"	"	
Pyrene	220	67.0	"	"	"	"	"	"	
Surr: Fluorene-d10	82.4 %	40-150							
Surr: Pyrene-d10	86.5 %	40-150							
Surr: Benzo (a) pyrene-d12	84.9 %	40-150							
<b>Stock 5 (P2L0336-05) Soil</b>					Sampled: 12/11/02 Received: 12/11/02				<b>R-05</b>
Acenaphthene	ND	67.0	ug/kg dry	5	EPA 8270m	12/11/02	12/12/02	2120412	
Acenaphthylene	ND	67.0	"	"	"	"	"	"	
Anthracene	ND	67.0	"	"	"	"	"	"	
Benzo (a) anthracene	124	67.0	"	"	"	"	"	"	
Benzo (a) pyrene	154	67.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	125	67.0	"	"	"	"	"	"	
Benzo (ghi) perylene	141	67.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	114	67.0	"	"	"	"	"	"	
Chrysene	163	67.0	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	67.0	"	"	"	"	"	"	
Fluoranthene	252	67.0	"	"	"	"	"	"	
Fluorene	ND	67.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	101	67.0	"	"	"	"	"	"	
Naphthalene	ND	67.0	"	"	"	"	"	"	
Phenanthrene	199	67.0	"	"	"	"	"	"	
Pyrene	290	67.0	"	"	"	"	"	"	
Surr: Fluorene-d10	76.0 %	40-150							
Surr: Pyrene-d10	82.4 %	40-150							
Surr: Benzo (a) pyrene-d12	86.5 %	40-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602621



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Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
12/13/02 17:13

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>Stock 6 (P2L0336-06) Soil</b>						Sampled: 12/11/02 Received: 12/11/02		R-05	
Acenaphthene	ND	67.0	ug/kg dry	5	EPA 8270m	12/11/02	12/12/02	2120412	
Acenaphthylene	ND	67.0	"	"	"	"	"	"	
Anthracene	ND	67.0	"	"	"	"	"	"	
Benzo (a) anthracene	131	67.0	"	"	"	"	"	"	
Benzo (a) pyrene	153	67.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	136	67.0	"	"	"	"	"	"	
Benzo (ghi) perylene	133	67.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	134	67.0	"	"	"	"	"	"	
Chrysene	201	67.0	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	67.0	"	"	"	"	"	"	
Fluoranthene	287	67.0	"	"	"	"	"	"	
Fluorene	ND	67.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	94.8	67.0	"	"	"	"	"	"	
Naphthalene	ND	67.0	"	"	"	"	"	"	
Phenanthrene	214	67.0	"	"	"	"	"	"	
Pyrene	399	67.0	"	"	"	"	"	"	
Surr: Fluorene-d10	93.6 %	40-150							
Surr: Pyrene-d10	90.0 %	40-150							
Surr: Benzo (a) pyrene-d12	89.7 %	40-150							

<b>Stock 7 (P2L0336-07) Soil</b>						Sampled: 12/11/02 Received: 12/11/02		R-05	
Acenaphthene	ND	26.8	ug/kg dry	2	EPA 8270m	12/11/02	12/12/02	2120412	
Acenaphthylene	29.1	26.8	"	"	"	"	"	"	
Anthracene	56.1	26.8	"	"	"	"	"	"	
Benzo (a) anthracene	140	26.8	"	"	"	"	"	"	
Benzo (a) pyrene	186	26.8	"	"	"	"	"	"	
Benzo (b) fluoranthene	139	26.8	"	"	"	"	"	"	
Benzo (ghi) perylene	168	26.8	"	"	"	"	"	"	
Benzo (k) fluoranthene	167	26.8	"	"	"	"	"	"	
Chrysene	197	26.8	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	30.9	26.8	"	"	"	"	"	"	
Fluoranthene	354	26.8	"	"	"	"	"	"	
Fluorene	28.0	26.8	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	115	26.8	"	"	"	"	"	"	
Naphthalene	ND	26.8	"	"	"	"	"	"	
Phenanthrene	271	26.8	"	"	"	"	"	"	
Pyrene	386	26.8	"	"	"	"	"	"	
Surr: Fluorene-d10	61.0 %	40-150							

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*Lisa Domenighini*

Lisa Domenighini, Project Manager

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POPT1S602622



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Hart Crowser  
 Five Centerpointe Drive  
 Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
 Project Number: 15230-05  
 Project Manager: Levi Fernandes

Reported:  
 12/13/02 17:13

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Note
<b>Stock 7 (P2L0336-07) Soil</b>						Sampled: 12/11/02 Received: 12/11/02		R-6	
Surr: Pyrene-d10	60.0 %	40-150							
Surr: Benzo (a) pyrene-d12	64.3 %	40-150							
<b>Stock 8 (P2L0336-08) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	12/11/02	12/12/02	2120412	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	82.3 %	40-150							
Surr: Pyrene-d10	95.9 %	40-150							
Surr: Benzo (a) pyrene-d12	82.5 %	40-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602623



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Hart Crowser  
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Project: POP-T-1 Parcel 3  
 Project Number: 15230-05  
 Project Manager: Levi Fernandes

Reported:  
 12/13/02 17:13

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>Stock 1 (P2L0336-01) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
% Solids	87.3	1.00 % by Weight		1	NCA SOP	12/11/02	12/12/02	2120430	
<b>Stock 2 (P2L0336-02) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
% Solids	86.8	1.00 % by Weight		1	NCA SOP	12/11/02	12/12/02	2120430	
<b>Stock 3 (P2L0336-03) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
% Solids	83.8	1.00 % by Weight		1	NCA SOP	12/11/02	12/12/02	2120430	
<b>Stock 4 (P2L0336-04) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
% Solids	88.8	1.00 % by Weight		1	NCA SOP	12/11/02	12/12/02	2120430	
<b>Stock 5 (P2L0336-05) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
% Solids	88.8	1.00 % by Weight		1	NCA SOP	12/11/02	12/12/02	2120430	
<b>Stock 6 (P2L0336-06) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
% Solids	88.6	1.00 % by Weight		1	NCA SOP	12/11/02	12/12/02	2120430	
<b>Stock 7 (P2L0336-07) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
% Solids	86.7	1.00 % by Weight		1	NCA SOP	12/11/02	12/12/02	2120430	
<b>Stock 8 (P2L0336-08) Soil</b>						Sampled: 12/11/02 Received: 12/11/02			
% Solids	89.4	1.00 % by Weight		1	NCA SOP	12/11/02	12/12/02	2120430	

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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 Environmental Laboratory Network

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POPT1S602624



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Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
12/13/02 17:13

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 2120410 - EPA 3550 Fuels</b>										
<b>Blank (2120410-BLK1)</b>										
				Prepared: 12/11/02 Analyzed: 12/12/02						
Diesel Range Organics	ND	25.0	mg/kg							
Heavy Oil Range Hydrocarbons	ND	50.0	"							
Surr: 1-Chlorooctadecane	4.93		"	4.80		103	50-150			
<b>LCS (2120410-BS1)</b>										
				Prepared: 12/11/02 Analyzed: 12/12/02						
Diesel Range Organics	118	25.0	mg/kg	125		94.4	50-150			
Heavy Oil Range Hydrocarbons	64.9	50.0	"	75.0		86.5	50-150			
Surr: 1-Chlorooctadecane	5.53		"	4.80		115	50-150			
<b>Duplicate (2120410-DUP1)</b>										
				Source: P2L0259-01 Prepared: 12/11/02 Analyzed: 12/12/02						
Diesel Range Organics	ND	25.0	mg/kg dry		ND				50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND				50	
Surr: 1-Chlorooctadecane	4.45		"	5.36		83.0	50-150			
<b>Duplicate (2120410-DUP2)</b>										
				Source: P2L0259-02 Prepared: 12/11/02 Analyzed: 12/12/02						
Diesel Range Organics	ND	25.0	mg/kg dry		ND				50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND				50	
Surr: 1-Chlorooctadecane	4.87		"	6.48		75.2	50-150			

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602625



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 Bend 20332 Empire Avenue, Suite F 1 Bend OR 97701 5711  
 541 383 9310 fax 541 382.7588  
 Anchorage 3209 Denali Street Anchorage AK 99503  
 907.334 9338 fax 907 334 9339

Hart Crowser Five Centerpointe Drive Lake Oswego OR 97035	Project POP T 1 Parcel 3 Project Number 15250-05 Project Manager Levi Fernandes	Reported 12/13/02 17 13
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**Polynuclear Aromatic Compounds per EPA 8270M-SIM - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	/RFC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

**Batch 2120412 EPA 3550**

**Blank (2120412 BLK1)**

Prepared 12/11/02 Analyzed 12/12/02

Acenaphthene	ND	13.4	ug/kg							
Acenaphthylene	ND	13.4								
Anthracene	ND	13.4								
Benzo (a) anthracene	ND	13.4								
Benzo (a) pyrene	ND	13.4								
Benzo (b) fluoranthene	ND	13.4								
Benzo (ghi) perylene	ND	13.4								
Benzo (k) fluoranthene	ND	13.4								
Chrysene	ND	13.4								
Dibenzo (a,h) anthracene	ND	13.4								
Fluoranthene	ND	13.4								
Fluorene	ND	13.4								
Indeno (1,2,3-cd) pyrene	ND	13.4								
Naphthalene	ND	13.4								
Phenanthrene	ND	13.4								
Pyrene	ND	13.4								

St. Fluorene d10	63.7			83.3		76.5	40.150
S. r. Pyrene d10	82.9			83.3		99.5	40.150
S. r. Benzo (a) pyrene-d12	73.4			83.3		88.1	40.150

**LCS (2120412-BS1)**

Prepared 12/11/02 Analyzed 12/12/02

Acenaphthene	158	13.4	ug/kg	167		94.6	33.139
Benzo (a) pyrene	158	13.4		167		94.6	45.149
Pyrene	168	13.4		167		101	39.138
S. r. Fluorene-d10	79.4			83.3		95.3	40.150
S. r. Pyrene-d10	87.5			83.3		105	40.150
S. r. Benzo (a) pyrene-d12	77.7			83.3		93.3	40.150

North Creek Analytical Portland

*Lisa Domenighini*

Lisa Domenighini Project Manager

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POPT1S602626



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 907 334 9338 fax 907 334 9339

Hart Crowser  
 Five Centerpointe Drive  
 Lake Oswego OR 97035

Project POP T I Parcel 3  
 Project Number 15230-05  
 Project Manager Levi Fernandes

Reported  
 12/13/02 17 13

Polynuclear Aromatic Compounds per EPA 8270M-SFM Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	/REC	/REC Limits	RPD	RPD Limit	Notes
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Batch 2120412 - EPA 3550

Matrix Spike (2120412 MS1) Source: P2L0336-01 Prepared 12/11/02 Analyzed 12/12/02 R-05

Acenaphthene	198	67.0	ug/kg dry	191	ND	87.2	33.139			
Benzo (a) pyrene	332	67.0		191	173	83.2	45.149			
Pyrene	628	67.0		191	369	136	39.138			
Surr Fluorene-d10	79.8			95.4		83.6	40.150			
Surr Pyrene-d10	85.1			95.4		89.2	40.150			
Surr Benzo (a) pyrene-d12	82.5			95.4		86.5	40.150			

Matrix Spike Dup (2120412 MSD1) Source: P2L0336-01 Prepared 12/11/02 Analyzed 12/12/02 R-05

Acenaphthene	210	67.0	ug/kg dry	191	ND	93.5	33.139	5.88	60	
Benzo (a) pyrene	329	67.0		191	173	81.7	45.149	0.908	60	
Pyrene	582	67.0		191	369	112	39.138	7.60	60	
Surr Fluorene-d10	90.5			95.4		94.9	40.150			
Surr Pyrene-d10	91.5			95.4		95.9	40.150			
Surr Benzo (a) pyrene d12	81.7			95.4		85.6	40.150			

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*Lisa Domenighini*

Lisa Domenighini Project Manager

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POPT1S602627



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541 383 9310 fax 541 382 7588

Hart Crowser	Project POP T 1 Parcel 3	Anchorage 3209 Denali Street, Anchorage, AK 99503 907 334 9338 fax 907 334 9339
Five Centerpointe Drive	Project Number 15230 05	Reported
Lake Oswego OR 97035	Project Manager Levi Fernandes	12/13/02 17 13

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	/ REC	/ REC Limits	RPD	RPD Limit	Notes
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Batch 2120430 - Dry Weight

Duplicate (2120430-DUP1)	Source P2L0226-01	Prepared 12/11/02	Analyzed 12/12/02							
/ Solids	79.9	1.00 / by Weight	79.9					0.00	20	
Duplicate (2120430-DUP2)	Source P2L0244-01	Prepared 12/11/02	Analyzed 12/12/02							
/ Solids	94.7	1.00 / by Weight	94.6					0.106	20	

North Creek Analytical Portland

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*Lisa Domenighini*

Lisa Domenighini Project Manager

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Environmental Laboratory Network

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POPT1S602628



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541.383.9310 fax 541.382.7588  
Anchorage 3209 Denali Street, Anchorage, AK 99503  
907.334.9338 fax 907.334.9339

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP-T-1 Parcel 3  
Project Number: 15230-05  
Project Manager: Levi Fernandes

Reported:  
12/13/02 17:13

#### Notes and Definitions

- A-01 Detected hydrocarbons are mainly due to overlap from the heavy/oil range; however, there is a trace of weathered diesel detected.
- D-17 Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.
- R-05 Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
- wet Sample results reported on a wet weight basis (as received)
- RPD Relative Percent Difference

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602629



# Sample Custody Record

DATE 12/11/02PAGE 1 OF 1**HARTCROWSER**Hart Crowser, Inc.  
Five Centerpointe Drive, Suite 240  
Lake Oswego, Oregon 97035

1210336

JOB NUMBER <u>15230-05</u> LAB NUMBER _____					TESTING												NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
PROJECT MANAGER <u>Herb Clough</u>																		
PROJECT NAME <u>Terminal 1 Parcel 3</u>																		
SAMPLED BY: <u>Levi Fernandez</u>																		
LAB NO.	SAMPLE	TIME	STATION	MATRIX														
	Stack 1	9:16		Soil	X	X										2	2 day TAT	
	Stack 2	9:33														2	please send email	
	Stack 3	10:48														2	report to Herb Clough	
	Stack 4	10:05														2	and Levi Fernandez	
	Stack 5	10:54														2		
	Stack 6	11:48														2		
	Stack 7	11:09														2		
	Stack 8	11:27														2		
RELINQUISHED BY					DATE	RECEIVED BY					DATE	TOTAL NUMBER					METHOD OF SHIPMENT	
P. Thomas Pivitt					12/11/02	Sarah Pissavage					12/11/02	16					HC deliver	
SIGNATURE					TIME	SIGNATURE					TIME	SPECIAL SHIPMENT/HANDLING					2.3°C coolant	
P. Thomas Pivitt					12:55 PM	Sarah Pissavage					12:55	OR STORAGE REQUIREMENTS						
PRINTED NAME						PRINTED NAME												
Hart Crowser						Hart Crowser												
COMPANY						COMPANY												
RELINQUISHED BY					DATE	RECEIVED BY					DATE	DISTRIBUTION:						
SIGNATURE					TIME	SIGNATURE					TIME	1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY						
PRINTED NAME						PRINTED NAME						2. RETURN PINK COPY TO PROJECT MANAGER						
COMPANY						COMPANY						3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT						
												4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER						

POPT1S602630



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503.906.9200 fax 503.906.9210  
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711  
541.383.9310 fax 541.382.7588

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes

Reported:  
10/29/02 16:34

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TP-3 (2-3)	P2J0627-01	Soil	10/09/02 10:49	10/21/02 16:10
TP-6 (2-3)	P2J0627-02	Soil	10/09/02 11:19	10/21/02 16:10
TP-11 (2-3)	P2J0627-03	Soil	10/09/02 13:01	10/21/02 16:10
TP-11 (9)	P2J0627-04	Soil	10/09/02 13:08	10/21/02 16:10
TP-12 (9)	P2J0627-05	Soil	10/09/02 13:19	10/21/02 16:10
TP-17 (9)	P2J0627-06	Soil	10/09/02 14:39	10/21/02 16:10
TP-23 (9)	P2J0627-07	Soil	10/10/02 13:21	10/21/02 16:10
TP-30 (2-3)	P2J0627-08	Soil	10/10/02 11:34	10/21/02 16:10

HART CROWSER, INC.

OCT 31 2002

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Lisa Domenighini, Project Manager

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes

Reported:  
10/29/02 16:34

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>TP-3 (2-3) (P2J0627-01) Soil</b>						Sampled: 10/09/02 Received: 10/21/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/22/02	10/22/02	2100730	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	99.4 %	50-150							
<b>TP-6 (2-3) (P2J0627-02) Soil</b>						Sampled: 10/09/02 Received: 10/21/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/22/02	10/22/02	2100730	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	91.3 %	50-150							
<b>TP-11 (2-3) (P2J0627-03) Soil</b>						Sampled: 10/09/02 Received: 10/21/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/22/02	10/22/02	2100730	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	95.1 %	50-150							
<b>TP-11 (9) (P2J0627-04) Soil</b>						Sampled: 10/09/02 Received: 10/21/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/22/02	10/22/02	2100730	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	90.1 %	50-150							
<b>TP-12 (9) (P2J0627-05) Soil</b>						Sampled: 10/09/02 Received: 10/21/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/22/02	10/22/02	2100730	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	90.4 %	50-150							
<b>TP-17 (9) (P2J0627-06) Soil</b>						Sampled: 10/09/02 Received: 10/21/02			
Diesel Range Organics	82.6	25.0	mg/kg dry	1	NWTPH-Dx	10/22/02	10/22/02	2100730	A-01
Heavy Oil Range Hydrocarbons	171	50.0	"	"	"	"	"	"	A-01
Surr: 1-Chlorooctadecane	107 %	50-150							

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes


Reported:  
10/29/02 16:34

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>TP-23 (9) (P2J0627-07) Soil</b>						Sampled: 10/10/02 Received: 10/21/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/22/02	10/22/02	2100730	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	97.7 %	50-150							
<b>TP-30 (2-3) (P2J0627-08) Soil</b>						Sampled: 10/10/02 Received: 10/21/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/22/02	10/22/02	2100730	
Heavy Oil Range Hydrocarbons	453	50.0	"	"	"	"	"	"	A-02
Surr: 1-Chlorooctadecane	105 %	50-150							

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes

Reported:  
10/29/02 16:34

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>TP-3 (2-3) (P2J0627-01) Soil</b>					Sampled: 10/09/02 Received: 10/21/02				
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	10/22/02	10/24/02	2100736	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	70.9 %	40-150							
Surr: Pyrene-d10	80.5 %	40-150							
Surr: Benzo (a) pyrene-d12	69.1 %	40-150							

<b>TP-6 (2-3) (P2J0627-02) Soil</b>					Sampled: 10/09/02 Received: 10/21/02				
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	10/22/02	10/24/02	2100736	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	70.9 %	40-150							

North Creek Analytical - Portland

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Lisa Domenighini, Project Manager

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes

Reported:  
10/29/02 16:34

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>TP-6 (2-3) (P2J0627-02) Soil</b>						Sampled: 10/09/02 Received: 10/21/02			
Surr: Pyrene-d10	81.8 %	40-150							
Surr: Benzo (a) pyrene-d12	69.0 %	40-150							

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POPT1S602635



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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes

Reported:  
10/29/02 16:34

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>TP-3 (2-3) (P2J0627-01) Soil</b>					Sampled: 10/09/02 Received: 10/21/02				
% Solids	93.8	1.00	% by Weight	1	NCA SOP	10/22/02	10/23/02	2100761	
<b>TP-6 (2-3) (P2J0627-02) Soil</b>					Sampled: 10/09/02 Received: 10/21/02				
% Solids	94.6	1.00	% by Weight	1	NCA SOP	10/22/02	10/23/02	2100761	
<b>TP-11 (2-3) (P2J0627-03) Soil</b>					Sampled: 10/09/02 Received: 10/21/02				
% Solids	90.7	1.00	% by Weight	1	NCA SOP	10/22/02	10/23/02	2100761	
<b>TP-11 (9) (P2J0627-04) Soil</b>					Sampled: 10/09/02 Received: 10/21/02				
% Solids	91.4	1.00	% by Weight	1	NCA SOP	10/22/02	10/23/02	2100761	
<b>TP-12 (9) (P2J0627-05) Soil</b>					Sampled: 10/09/02 Received: 10/21/02				
% Solids	92.0	1.00	% by Weight	1	NCA SOP	10/22/02	10/23/02	2100761	
<b>TP-17 (9) (P2J0627-06) Soil</b>					Sampled: 10/09/02 Received: 10/21/02				
% Solids	90.5	1.00	% by Weight	1	NCA SOP	10/22/02	10/23/02	2100761	
<b>TP-23 (9) (P2J0627-07) Soil</b>					Sampled: 10/10/02 Received: 10/21/02				
% Solids	90.9	1.00	% by Weight	1	NCA SOP	10/22/02	10/23/02	2100761	
<b>TP-30 (2-3) (P2J0627-08) Soil</b>					Sampled: 10/10/02 Received: 10/21/02				
% Solids	89.8	1.00	% by Weight	1	NCA SOP	10/22/02	10/23/02	2100761	

North Creek Analytical - Portland

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes

Reported:  
10/29/02 16:34

**Diesel and Heavy Range Hydrocarbons per NWTPH-D Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 2100730 - EPA 3550 Fuels</b>										
<b>Blank (2100730-BLK1)</b>				Prepared & Analyzed: 10/22/02						
Diesel Range Organics	ND	25.0	mg/kg							
Heavy Oil Range Hydrocarbons	ND	50.0	"							
Surr: 1-Chlorooctadecane	4.70		"	4.80		97.9	50-150			
<b>LCS (2100730-BS1)</b>				Prepared & Analyzed: 10/22/02						
Diesel Range Organics	116	25.0	mg/kg	125		92.8	50-150			
Heavy Oil Range Hydrocarbons	80.0	50.0	"	75.0		107	50-150			
Surr: 1-Chlorooctadecane	4.97		"	4.80		104	50-150			
<b>Duplicate (2100730-DUP1)</b>				Source: P2J0627-01		Prepared & Analyzed: 10/22/02				
Diesel Range Organics	ND	25.0	mg/kg dry		ND				50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND				50	
Surr: 1-Chlorooctadecane	4.92		"	5.12		96.1	50-150			
<b>Duplicate (2100730-DUP2)</b>				Source: P2J0627-02		Prepared & Analyzed: 10/22/02				
Diesel Range Organics	ND	25.0	mg/kg dry		ND				50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND				50	
Surr: 1-Chlorooctadecane	4.83		"	5.07		95.3	50-150			

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POPT1S602637



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Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes

Reported:  
10/29/02 16:34

Polynuclear Aromatic Compounds per EPA 8270M-SIM: Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch 2100736 - EPA 3550

Blank (2100736-BLK1)

Prepared: 10/22/02 Analyzed: 10/24/02

Acenaphthene	ND	13.4	ug/kg						
Acenaphthylene	ND	13.4	"						
Anthracene	ND	13.4	"						
Benzo (a) anthracene	ND	13.4	"						
Benzo (a) pyrene	ND	13.4	"						
Benzo (b) fluoranthene	ND	13.4	"						
Benzo (ghi) perylene	ND	13.4	"						
Benzo (k) fluoranthene	ND	13.4	"						
Chrysene	ND	13.4	"						
Dibenzo (a,b) anthracene	ND	13.4	"						
Fluoranthene	ND	13.4	"						
Fluorene	ND	13.4	"						
Indeno (1,2,3-cd) pyrene	ND	13.4	"						
Naphthalene	ND	13.4	"						
Phenanthrene	ND	13.4	"						
Pyrene	ND	13.4	"						
Surr: Fluorene-d10	59.3		"	83.3		71.2	40-150		
Surr: Pyrene-d10	66.1		"	83.3		79.4	40-150		
Surr: Benzo (a) pyrene-d12	56.7		"	83.3		68.1	40-150		

LCS (2100736-BS1)

Prepared: 10/22/02 Analyzed: 10/24/02

Acenaphthene	116	13.4	ug/kg	167		69.5	33-139		
Benzo (a) pyrene	120	13.4	"	167		71.9	45-149		
Pyrene	134	13.4	"	167		80.2	39-138		
Surr: Fluorene-d10	57.6		"	83.3		69.1	40-150		
Surr: Pyrene-d10	66.2		"	83.3		79.5	40-150		
Surr: Benzo (a) pyrene-d12	58.4		"	83.3		70.1	40-150		

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Hart Crowser  
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Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes

Reported:  
10/29/02 16:34

**Polynuclear Aromatic Compounds per EPA 8210M-SIM - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 2100736 - EPA 3550**

**Matrix Spike (2100736-MS1)**

Source: P2J0627-01

Prepared: 10/22/02 Analyzed: 10/24/02

Acenaphthene	121	13.4	ug/kg dry	178	ND	68.0	33-139			
Benzo (a) pyrene	126	13.4	"	178	ND	70.8	45-149			
Pyrene	138	13.4	"	178	ND	77.5	39-138			
Surr: Fluorene-d10	61.5		"	88.8		69.3	40-150			
Surr: Pyrene-d10	66.0		"	88.8		74.3	40-150			
Surr: Benzo (a) pyrene-d12	60.4		"	88.8		68.0	40-150			

**Matrix Spike Dup (2100736-MSD1)**

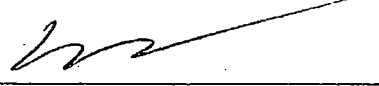
Source: P2J0627-01

Prepared: 10/22/02 Analyzed: 10/24/02

Acenaphthene	124	13.4	ug/kg dry	178	ND	69.7	33-139	2.45	60	
Benzo (a) pyrene	128	13.4	"	178	ND	71.9	45-149	1.57	60	
Pyrene	146	13.4	"	178	ND	82.0	39-138	5.63	60	
Surr: Fluorene-d10	63.4		"	88.8		71.4	40-150			
Surr: Pyrene-d10	70.0		"	88.8		78.8	40-150			
Surr: Benzo (a) pyrene-d12	61.9		"	88.8		69.7	40-150			

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Hart Crowser  
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Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes

Reported:  
10/29/02 16:34

Percent Dry Weight (Solids) per Standard Methods Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch 2100761 - Dry Weight

Duplicate (2100761-DUP1)

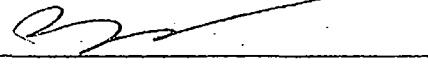
Source: P2J0629-01

Prepared: 10/22/02 Analyzed: 10/23/02

% Solids	91.5	1.00 % by Weight	91.1	0.438	20
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Hart Crowser  
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Lake Oswego, OR 97035

Project: T-1 South Parcel 3  
Project Number: 15230-03  
Project Manager: Levi Fernandes

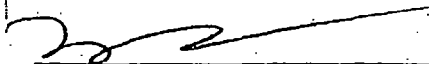
Reported:  
10/29/02 16:34

#### Notes and Definitions

- A-01 Detected hydrocarbons have distinct peaks that have elution patterns similar to that of PAH's, as well as other extraneous peaks that may be due to biogenic interference.
- A-02 Detected hydrocarbons contain extraneous peaks that may be due to biogenic interference; however there is heavy oil detected.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
- wet Sample results reported on a wet weight basis (as received)
- RPD Relative Percent Difference

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POPT1S602641



Handwritten: P2J0627

Hart Crowser, Inc.  
Five Centerpointe Drive, Suite 240  
Lake Oswego, Oregon 97035

DATE 10/21/02

PAGE 1 OF 1

JOB NUMBER <u>15230-03</u> LAB NUMBER _____					TESTING										OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS	
PROJECT MANAGER <u>Herb Clough / Report to Levi Fernandez</u>					TPH-Dx	PAHs	F270	S1M								NO. OF CONTAINERS
PROJECT NAME <u>Terminal 1 South</u>																
SAMPLED BY: <u>L. Fernandez</u>																
LAB NO.	SAMPLE	TIME	STATION	MATRIX	TPH-Dx	PAHs	F270	S1M								
101902	TP-3(2-3)	1119	1049	Soil	X	X									2	1 week TAT
	TP-6 (2-3)	1119		"	X	X									2	
	TP-11(2-3)	1301		"	X										1	
	TP-11(9)	1308		"	X										1	
	TP-12(9)	1319		"	X										1	
	TP-17(9)	1439		"	X										1	
10110102	TP-23(9)	1321		"	X										1	
10110102	TP-30(1-3)	1134		"	X										1	
RELINQUISHED BY <u>[Signature]</u> DATE <u>10/21/02</u>					TOTAL NUMBER OF CONTAINERS <u>10</u>										METHOD OF SHIPMENT	
SIGNATURE <u>Levi Fernandez</u> TIME <u>10/21/02</u>					SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS										<u>coolant 1.8°C</u>	
PRINTED NAME <u>Hart Crowser</u> COMPANY <u>NCP</u>																
RELINQUISHED BY _____ DATE _____																
SIGNATURE _____ TIME _____					DISTRIBUTION:											
PRINTED NAME _____ COMPANY _____					1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY											
					2. RETURN PINK COPY TO PROJECT MANAGER											
					3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT											
					4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER											

POPT1S602642



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Hart Crowser  
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Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TP-1 (2-3)	P2J0394-01	Soil	10/09/02 09:50	10/11/02 14:40
TP-5 (2-3)	P2J0394-02	Soil	10/09/02 11:14	10/11/02 14:40
TP-8 (2-3)	P2J0394-03	Soil	10/09/02 11:52	10/11/02 14:40
TP-8 (9)	P2J0394-04	Soil	10/09/02 12:01	10/11/02 14:40
TP-9 (2-3)	P2J0394-05	Soil	10/09/02 12:31	10/11/02 14:40
TP-9 (9)	P2J0394-06	Soil	10/09/02 12:39	10/11/02 14:40
TP-13 (9)	P2J0394-07	Soil	10/09/02 14:12	10/11/02 14:40
TP-15 (2-3)	P2J0394-08	Soil	10/09/02 13:31	10/11/02 14:40
TP-16 (9)	P2J0394-09	Soil	10/09/02 14:25	10/11/02 14:40
TP-19 (9)	P2J0394-10	Soil	10/10/02 09:05	10/11/02 14:40
TP-22 (9)	P2J0394-11	Soil	10/10/02 12:55	10/11/02 14:40
TP-29 (2-3)	P2J0394-12	Soil	10/10/02 11:20	10/11/02 14:40
TP-25 (2-3)	P2J0394-13	Soil	10/10/02 09:34	10/11/02 14:40
TP-27 (2-3)	P2J0394-14	Soil	10/10/02 10:20	10/11/02 14:40
TP-28 (2-3)	P2J0394-15	Soil	10/10/02 10:45	10/11/02 14:40
TP-33 (2-3)	P2J0394-16	Soil	10/10/02 09:42	10/11/02 14:40

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OCT 22 2002

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
TP-1 (2-3) (P2J0394-01) Soil						Sampled: 10/09/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/16/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	91.5 %	50-150							
TP-5 (2-3) (P2J0394-02) Soil						Sampled: 10/09/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/16/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	91.7 %	50-150							
TP-8 (2-3) (P2J0394-03) Soil						Sampled: 10/09/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/16/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	90.9 %	50-150							
TP-8 (9) (P2J0394-04) Soil						Sampled: 10/09/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/15/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	93.3 %	50-150							
TP-9 (2-3) (P2J0394-05) Soil						Sampled: 10/09/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/15/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	91.5 %	50-150							
TP-9 (9) (P2J0394-06) Soil						Sampled: 10/09/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/15/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	91.5 %	50-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602644



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Hart Crowser  
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Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>TP-13 (9) (P2J0394-07) Soil</b>									
						Sampled: 10/09/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/16/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	86.6 %	50-150							
<b>TP-15 (2-3) (P2J0394-08) Soil</b>									
						Sampled: 10/09/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/15/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	100 %	50-150							
<b>TP-16 (9) (P2J0394-09) Soil</b>									
						Sampled: 10/09/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/15/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	112 %	50-150							
<b>TP-19 (9) (P2J0394-10) Soil</b>									
						Sampled: 10/10/02 Received: 10/11/02			
Diesel Range Organics	164	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/15/02	2100484	A-01
Heavy Oil Range Hydrocarbons	155	50.0	"	"	"	"	"	"	A-01
Surr: 1-Chlorooctadecane	121 %	50-150							
<b>TP-22 (9) (P2J0394-11) Soil</b>									
						Sampled: 10/10/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/15/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	109 %	50-150							
<b>TP-29 (2-3) (P2J0394-12) Soil</b>									
						Sampled: 10/10/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/15/02	10/15/02	2100484	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	103 %	50-150							

North Creek Analytical - Portland

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POPT1S602645



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Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

**Diesel and Heavy Range Hydrocarbons per NWTPH-Dx Method**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>TP-25 (2-3) (P2J0394-13) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/16/02	10/16/02	2100534	
Heavy Oil Range Hydrocarbons	230	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	110 %	50-150							
<b>TP-27 (2-3) (P2J0394-14) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/16/02	10/16/02	2100534	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	105 %	50-150							
<b>TP-28 (2-3) (P2J0394-15) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/16/02	10/16/02	2100534	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	92.4 %	50-150							
<b>TP-33 (2-3) (P2J0394-16) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
Diesel Range Organics	ND	25.0	mg/kg dry	1	NWTPH-Dx	10/16/02	10/16/02	2100534	
Heavy Oil Range Hydrocarbons	ND	50.0	"	"	"	"	"	"	
Surr: 1-Chlorooctadecane	97.0 %	50-150							

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Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
TP-1 (2-3) (P2J0394-01) Soil									
						Sampled: 10/09/02 Received: 10/11/02			
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	10/15/02	10/16/02	2100490	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	80.6 %	40-150							
Surr: Pyrene-d10	91.0 %	40-150							
Surr: Benzo (a) pyrene-d12	75.7 %	40-150							


**TP-5 (2-3) (P2J0394-02) Soil**

Sampled: 10/09/02 Received: 10/11/02

Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	10/15/02	10/16/02	2100490	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	ND	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	ND	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	ND	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	78.3 %	40-150							

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Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

**Polynuclear Aromatic Compounds per EPA 8270M-SIM**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>TP-5 (2-3) (P2J0394-02) Soil</b>						Sampled: 10/09/02 Received: 10/11/02			
Surr: Pyrene-d10	87.3 %	40-150							
Surr: Benzo (a) pyrene-d12	76.4 %	40-150							
<b>TP-33 (2-3) (P2J0394-16) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
Acenaphthene	ND	13.4	ug/kg dry	1	EPA 8270m	10/15/02	10/16/02	2100490	
Acenaphthylene	ND	13.4	"	"	"	"	"	"	
Anthracene	ND	13.4	"	"	"	"	"	"	
Benzo (a) anthracene	17.9	13.4	"	"	"	"	"	"	
Benzo (a) pyrene	ND	13.4	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	13.4	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	13.4	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	13.4	"	"	"	"	"	"	
Chrysene	13.8	13.4	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	ND	13.4	"	"	"	"	"	"	
Fluoranthene	19.6	13.4	"	"	"	"	"	"	
Fluorene	ND	13.4	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.4	"	"	"	"	"	"	
Naphthalene	ND	13.4	"	"	"	"	"	"	
Phenanthrene	ND	13.4	"	"	"	"	"	"	
Pyrene	22.0	13.4	"	"	"	"	"	"	
Surr: Fluorene-d10	79.1 %	40-150							
Surr: Pyrene-d10	85.2 %	40-150							
Surr: Benzo (a) pyrene-d12	72.2 %	40-150							

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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Environmental Laboratory Network

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Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>TP-1 (2-3) (P2J0394-01) Soil</b>						Sampled: 10/09/02 Received: 10/11/02			
% Solids	94.5	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-5 (2-3) (P2J0394-02) Soil</b>						Sampled: 10/09/02 Received: 10/11/02			
% Solids	95.1	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-8 (2-3) (P2J0394-03) Soil</b>						Sampled: 10/09/02 Received: 10/11/02			
% Solids	94.8	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-8 (9) (P2J0394-04) Soil</b>						Sampled: 10/09/02 Received: 10/11/02			
% Solids	94.0	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-9 (2-3) (P2J0394-05) Soil</b>						Sampled: 10/09/02 Received: 10/11/02			
% Solids	95.0	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-9 (9) (P2J0394-06) Soil</b>						Sampled: 10/09/02 Received: 10/11/02			
% Solids	93.2	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-13 (9) (P2J0394-07) Soil</b>						Sampled: 10/09/02 Received: 10/11/02			
% Solids	93.3	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-15 (2-3) (P2J0394-08) Soil</b>						Sampled: 10/09/02 Received: 10/11/02			
% Solids	91.0	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-16 (9) (P2J0394-09) Soil</b>						Sampled: 10/09/02 Received: 10/11/02			
% Solids	90.7	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	

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Project: POP - T-1  
 Project Number: 15230-03/ South Parcel 3  
 Project Manager: Levi Fernandez

Reported:  
 10/18/02 16:47

**Percent Dry Weight (Solids) per Standard Methods**  
**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
<b>TP-19 (9) (P2J0394-10) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
% Solids	91.7	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-22 (9) (P2J0394-11) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
% Solids	91.7	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-29 (2-3) (P2J0394-12) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
% Solids	92.6	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-25 (2-3) (P2J0394-13) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
% Solids	86.0	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-27 (2-3) (P2J0394-14) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
% Solids	88.4	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-28 (2-3) (P2J0394-15) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
% Solids	91.6	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	
<b>TP-33 (2-3) (P2J0394-16) Soil</b>						Sampled: 10/10/02 Received: 10/11/02			
% Solids	90.3	1.00	% by Weight	1	NCA SOP	10/16/02	10/17/02	2100565	

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Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47


**Diesel and Heavy Range Hydrocarbons per NWI PH-DX Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 2100484 - EPA 3550 Fuels</b>									
<b>Blank (2100484-BLK1)</b>				Prepared & Analyzed: 10/15/02					
Diesel Range Organics	ND	25.0	mg/kg						
Heavy Oil Range Hydrocarbons	ND	50.0	"						
Surr: 1-Chlorooctadecane	4.35		"	4.80		90.6	50-150		
<b>LCS (2100484-BS1)</b>				Prepared & Analyzed: 10/15/02					
Diesel Range Organics	116	25.0	mg/kg	125		92.8	50-150		
Heavy Oil Range Hydrocarbons	77.5	50.0	"	75.0		103	50-150		
Surr: 1-Chlorooctadecane	4.22		"	4.80		87.9	50-150		
<b>Duplicate (2100484-DUP1)</b>				Source: P2J0191-01		Prepared: 10/15/02 Analyzed: 10/16/02			
Diesel Range Organics	19900	2500	mg/kg dry		20100		1.00	50	
Heavy Oil Range Hydrocarbons	82500	5000	"		86300		4.50	50	
Surr: 1-Chlorooctadecane	0.00		"	5.65		NR	50-150		S-01
<b>Duplicate (2100484-DUP2)</b>				Source: P2J0191-02		Prepared & Analyzed: 10/15/02			
Diesel Range Organics	2070	500	mg/kg dry		1390		39.3	50	
Heavy Oil Range Hydrocarbons	9970	1000	"		7190		32.4	50	
Surr: 1-Chlorooctadecane	0.00		"	6.26		NR	50-150		S-01
<b>Batch 2100534 - EPA 3550 Fuels</b>									
<b>Blank (2100534-BLK1)</b>				Prepared & Analyzed: 10/16/02					
Diesel Range Organics	ND	25.0	mg/kg						
Heavy Oil Range Hydrocarbons	ND	50.0	"						
Surr: 1-Chlorooctadecane	5.02		"	4.80		105	50-150		
<b>LCS (2100534-BS1)</b>				Prepared & Analyzed: 10/16/02					
Diesel Range Organics	110	25.0	mg/kg	125		88.0	50-150		
Heavy Oil Range Hydrocarbons	72.9	50.0	"	75.0		97.2	50-150		
Surr: 1-Chlorooctadecane	4.72		"	4.80		98.3	50-150		

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POPT1S602651



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Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

**Diesel and Heavy Range Hydrocarbons per NW-EPH-Dx Method - Quality Control**

**North Creek Analytical - Portland**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 2100534 - EPA 3550 Fuels</b>									
<b>Duplicate (2100534-DUP1)</b>		<b>Source: P2J0239-05</b>		<b>Prepared &amp; Analyzed: 10/16/02</b>					
Diesel Range Organics	351	25.0	mg/kg wet		320		9.24	50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND			50	
<i>Surr: 1-Chlorooctadecane</i>	5.55		"	4.80		116	50-150		
<b>Duplicate (2100534-DUP2)</b>		<b>Source: P2J0427-01</b>		<b>Prepared &amp; Analyzed: 10/16/02</b>					
Diesel Range Organics	ND	25.0	mg/kg wet		ND			50	
Heavy Oil Range Hydrocarbons	ND	50.0	"		ND			50	
<i>Surr: 1-Chlorooctadecane</i>	3.96		"	4.80		82.5	50-150		

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541.383.9310 fax 541.382.7588

Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

Polynuclear Aromatic Compounds per EPA 8210M-SIM Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 2100490 - EPA 3550

Blank (2100490-BLK1)

Prepared: 10/15/02 Analyzed: 10/16/02

Acenaphthene	ND	13.4	ug/kg
Acenaphthylene	ND	13.4	"
Anthracene	ND	13.4	"
Benzo (a) anthracene	ND	13.4	"
Benzo (a) pyrene	ND	13.4	"
Benzo (b) fluoranthene	ND	13.4	"
Benzo (ghi) perylene	ND	13.4	"
Benzo (k) fluoranthene	ND	13.4	"
Chrysene	ND	13.4	"
Dibenzo (a,h) anthracene	ND	13.4	"
Fluoranthene	ND	13.4	"
Fluorene	ND	13.4	"
Indeno (1,2,3-cd) pyrene	ND	13.4	"
Naphthalene	ND	13.4	"
Phenanthrene	ND	13.4	"
Pyrene	ND	13.4	"

Surr: Fluorene-d10	58.2	"	83.3	69.9	40-150
Surr: Pyrene-d10	66.6	"	83.3	80.0	40-150
Surr: Benzo (a) pyrene-d12	59.0	"	83.3	70.8	40-150

LCS (2100490-BS1)

Prepared: 10/15/02 Analyzed: 10/16/02

Acenaphthene	119	13.4	ug/kg	167	71.3	33-139
Benzo (a) pyrene	106	13.4	"	167	63.5	45-149
Pyrene	128	13.4	"	167	76.6	39-138

Surr: Fluorene-d10	68.1	"	83.3	81.8	40-150
Surr: Pyrene-d10	70.1	"	83.3	84.2	40-150
Surr: Benzo (a) pyrene-d12	61.1	"	83.3	73.3	40-150

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

Polynuclear Aromatic Compounds per EPA 8270M SIM Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	----------------	-----	--------------	-------

Batch 2100490 - EPA 3550

Matrix Spike (2100490-MS1)	Source: P2J0186-03			Prepared: 10/15/02 Analyzed: 10/17/02			R-05		
Acenaphthene	128		ug/kg dry	194	ND	66.0	33-139		
Benzo (a) pyrene	126		"	194	ND	64.9	45-149		
Pyrene	135		"	194	ND	69.6	39-138		
Surr: Fluorene-d10	71.6		"	97.2		73.7	40-150		
Surr: Pyrene-d10	67.7		"	97.2		69.7	40-150		
Surr: Benzo (a) pyrene-d12	115		"	97.2		118	40-150		

Matrix Spike Dup (2100490-MSD1)	Source: P2J0186-03			Prepared: 10/15/02 Analyzed: 10/17/02			R-05		
Acenaphthene	127		ug/kg dry	194	ND	65.5	33-139	0.784	60
Benzo (a) pyrene	124		"	194	ND	63.9	45-149	1.60	60
Pyrene	131		"	194	ND	67.5	39-138	3.01	60
Surr: Fluorene-d10	68.4		"	97.2		70.4	40-150		
Surr: Pyrene-d10	66.9		"	97.2		68.8	40-150		
Surr: Benzo (a) pyrene-d12	112		"	97.2		115	40-150		

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Hart Crowser  
Five Centerpointe Drive  
Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

Percent Dry Weight (Solids) per Standard Methods - Quality Control

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch 2100565 - Dry Weight

Duplicate (2100565-DUP1) Source: P2J0394-01 Prepared: 10/16/02 Analyzed: 10/17/02

% Solids	94.5	1.00 % by Weight		94.5		0.00	20
----------	------	------------------	--	------	--	------	----

Duplicate (2100565-DUP2) Source: P2J0407-01 Prepared: 10/16/02 Analyzed: 10/17/02

% Solids	76.5	1.00 % by Weight		76.3		0.262	20
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Hart Crowser  
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Lake Oswego, OR 97035

Project: POP - T-1  
Project Number: 15230-03/ South Parcel 3  
Project Manager: Levi Fernandez

Reported:  
10/18/02 16:47

#### Notes and Definitions

- A-01 Detected hydrocarbons have distinct peaks that have elution patterns similar to that of PAH's, as well as other extraneous peaks that may be due to biogenic interference.
- R-05 Reporting limits raised due to dilution necessary for analysis. Sample contains high levels of reported analyte, non-target analyte, and/or matrix interference.
- S-01 The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. MRLs are adjusted if %Solids are less than 50%.
- wet Sample results reported on a wet weight basis (as received)
- RPD Relative Percent Difference

North Creek Analytical - Portland

Lisa Domenighini, Project Manager

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POPT1S602656

# Sample Custody Record

DATE 10/11/02

PAGE 1 OF 2



**HART CROWSER**

Hart Crowser, Inc.  
Five Centerpointe Drive, Suite 240  
Lake Oswego, Oregon 97035

POPT1S602657

JOB NUMBER <u>15230-03</u> LAB NUMBER _____ PROJECT MANAGER <u>Herb Clough</u> Report to <u>Levi Fernandez</u> PROJECT NAME <u>Terminal 1 South Parcel 3</u>					<b>TESTING</b>										NO. OF CONTAINERS	OBSERVATIONS / COMMENTS / COMPOSITING INSTRUCTIONS		
SAMPLED BY: <u>L. Fernandez</u>					(Grid for testing results with columns for various parameters and rows for individual samples)													
LAB NO.	SAMPLE	TIME	STATION	MATRIX	TPH-D <sub>5</sub>	PAH <sub>5</sub>												
	TP-1(2-3)	9:50		Soil	X	X											2	
	TP-5(2-3)	11:14		"	X	X											2	
	TP-8(2-3)	11:52		"	X												1	
	TP-8(9)	12:01		"	X												1	
	TP-9(2-3)	12:31		"	X												1	
	TP-9(9)	12:39		"	X												1	
	TP-13(9)	2:12		"	X												1	
	TP-15(2-3)	1:31		"	X												1	
	TP-16(9)	2:25		"	X												1	
	TP-19(9)	9:05		"	X												1	
	TP-22(9)	12:55		"	X												1	
	TP-29(2-3)	11:20		"	X												1	
RELINQUISHED BY		DATE	RECEIVED BY		DATE		TOTAL NUMBER OF CONTAINERS										METHOD OF SHIPMENT	
<u>[Signature]</u>		<u>10/11/02</u>	<u>[Signature]</u>		<u>10/11/02</u>		14											
SIGNATURE		TIME	SIGNATURE		TIME		SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS											
<u>Levi Fernandez</u>			<u>Bib F</u>				1.5°C											
PRINTED NAME			PRINTED NAME															
<u>Hart Crowser</u>		<u>14:10</u>	<u>NCA</u>		<u>14:10</u>													
COMPANY			COMPANY															
RELINQUISHED BY		DATE	RECEIVED BY		DATE		DISTRIBUTION:											
<u>[Signature]</u>			<u>[Signature]</u>		<u>10/11/02</u>		1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY											
SIGNATURE		TIME	SIGNATURE		TIME		2. RETURN PINK COPY TO PROJECT MANAGER											
<u>[Signature]</u>			<u>[Signature]</u>				3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT											
PRINTED NAME			PRINTED NAME				4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER											
<u>[Signature]</u>			<u>NCA</u>		<u>14:40</u>													
COMPANY			COMPANY															

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# HART CROWSER

**Hart Crowser, Inc.**  
Five Centerpointe Drive, Suite 240  
Lake Oswego, Oregon 97035

[illegible]

POPT1S602658

**APPENDIX F**  
**RESIDUAL RISK ASSESSMENT TABLES**

**Table F-1 - COPC Identification Table**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

	Soil (Concentrations in mg/kg)						Groundwater (Concentrations in µg/L)						SRIj	Multiple Media COPC?
	PRG	Cij	Rj	COPC?	Rij/Rj	COPC?	PRG	Cij	Rij	COPC?	Rij/Rj	COPC?		
Total Petroleum Hydrocarbons														
Diesel	NA	1.2E+03	--	Yes <sup>1</sup>	--	Yes <sup>1</sup>	NA	4.2E+02	--	Yes <sup>1</sup>	--	Yes <sup>1</sup>	na	No
Oil	NA	1.8E+03	--	Yes <sup>1</sup>	--	Yes <sup>1</sup>	--	ND	--	--	--	--	na	No
Semivolatiles														
Acenaphthene	3.7E+03	6.6E+00	1.8E-03	No	5.5E-05	No	4.2E+03	7.2E-01	1.7E-04	No	4.6E-03	No	2.0E-03	No
Anthracene	2.2E+04	6.0E-02	2.7E-06	No	8.4E-08	No	--	ND	--	--	--	--	2.7E-06	No
Benzo(a)anthracene	6.2E-01	1.3E-01	2.1E-01	No	6.4E-03	No	--	ND	--	--	--	--	2.1E-01	No
Benzo(a)pyrene	6.2E-02	1.9E-01	3.0E+00	Yes	9.2E-02	Yes	--	ND	--	--	--	--	3.0E+00	Yes
Benzo(b)fluoranthene	6.2E-01	2.1E-01	3.4E-01	No	1.0E-02	No	--	ND	--	--	--	--	3.4E-01	No
Benzo(g,h,i)perylene	2.3E+03	1.7E-01	7.2E-05	No	2.2E-06	No	--	ND	--	--	--	--	7.2E-05	No
Benzo(k)fluoranthene	6.2E+00	6.5E-02	1.0E-02	No	3.2E-04	No	--	ND	--	--	--	--	1.0E-02	No
Chrysene	6.2E+01	1.3E-01	2.1E-03	No	6.4E-05	No	--	ND	--	--	--	--	2.1E-03	No
Fluoranthene	2.3E+03	5.6E-01	2.4E-04	No	7.5E-06	No	--	NE	--	--	--	--	2.4E-04	No
Indeno(1,2,3-cd)pyrene	6.2E-01	1.1E-01	1.8E-01	No	5.5E-03	No	--	ND	--	--	--	--	1.8E-01	No
Naphthalene	5.6E+01	3.4E-02	6.1E-04	No	1.9E-05	No	--	ND	--	--	--	--	6.1E-04	No
Phenanthrene	2.2E+04	3.7E-01	1.7E-05	No	5.1E-07	No	4.3E+01	1.3E+00	2.9E-02	No	7.8E-01	Yes	2.9E-02	No
Pyrene	2.3E+03	4.3E-01	1.9E-04	No	5.7E-06	No	1.4E+02	5.6E-01	4.0E-03	No	1.1E-01	No	4.2E-03	No
Metals														
Arsenic	3.9E-01	1.1E+01	2.9E+01	Yes	8.8E-01	Yes	--	NE	--	--	--	--	2.9E+01	Yes
Cadmium	3.7E+01	1.3E+00	3.6E-02	No	1.1E-03	No	--	ND	--	--	--	--	3.6E-02	No
Lead	4.0E+02	2.8E+01	7.0E-02	No	2.2E-03	No	--	NE	--	--	--	--	7.0E-02	No
Volatiles														
Tetrachloroethene	--	nd	--	No	--	No	7.6E+02	3.1E+00	4.0E-03	No	1.1E-01	No	4.0E-03	No
Rj			3.3E+01								3.7E-02			
Nij			1.8E+01								5.0E+00			
1/Nij			5.6E-02								2.0E-01			

F:\DATA\Jobs\Port of Portland\5230 Term 1 Support\5230-05 Parcel 3\Construction Report\Residual Risk Section\Appendix Tables\Table F-01 COPC

**Notes:**

<sup>(1)</sup> COPC identified based on the presence of TPH in site soils and groundwater. No PRG is available for screening.

**Variables:**

PRG = Soil (EPA Region 9 Residential PRG); Groundwater (DEQ's RBDM Groundwater to Indoor Air).

Cij = Maximum detected concentration of compound i in medium j.

Rij = Risk ratio for compound i in medium j (Cij/PRG); compound is a COPC if Rij is greater than 1.

Rj = Sum of risk ratios for medium j.

Nij = Number of compounds i detected in medium j.

Rij/Rj = Compound is a COPC if this ratio is greater than 1/Nij.

SRIj = Summary risk ratio for compound i in all media (total Rij across all media); compound is a COPC if SRIj is greater than 1.

**Acronyms:**

NA = Not Available.

ND = Not Detected.

NE = Not Evaluated (only volatile compounds evaluated).

-- = Not Applicable.

**Table F-2 - Exposure Point Concentrations: Soil and Groundwater  
Residential Risk Assessment  
Marine Terminal 1 South, Parcel 3 (Area A)**

Analyte	Detection Frequency	SQL Range (Min-Max)	Detect Range (Min-Max)	Max	Sample ID of Maximum Detection	Distribution	90 % UCL	Arithmetic Mean	EPC	
									RME	CT
AREA A: SURFACE SOIL (0 to 3 feet bgs)										
PAHs in mg/kg	1/13	0.0134 - 1.0	0.0292	0.0292	B-74 (2.5)	Maximum	2.9E-02	5.2E-02	2.9E-02	2.9E-02
Benzo(a)pyrene										
Metals in mg/kg	3/6	1.0	1.64 - 7.53	7.53	B-97 (3)	Lognormal	1.4E+01	2.4E+00	7.5E+00	2.4E+00
Arsenic										
AREA A: TOTAL SOIL (0 to 15 feet bgs)										
PAHs in mg/kg	9/36	0.01 - 1.0	0.0157 - 0.185	0.185	B-94 (10)	Weak Lognormal	5.1E-02	4.2E-02	5.1E-02	4.2E-02
Benzo(a)pyrene										
Metals in mg/kg	6/9	1.0	1.35 - 11.2	11.2	B-11 (9-11)	Lognormal	9.9E+00	3.2E+00	9.9E+00	3.2E+00
Arsenic										

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**Notes:**

**Acronyms and Abbreviations:**

EPC = Exposure point concentration.

PAHs = Polynuclear aromatic hydrocarbons.

RME = Reasonable maximum exposure.

TPH = Total petroleum hydrocarbons.

UCL = Upper confidence limit on the mean.

VOCs = Volatile organic compounds.

CT = Central Tendency.

SQL = Standard quantification limit.

NA = Not applicable.

**Table F-3 - Exposure Dose Equations and Exposure Factor Values: Soil Ingestion  
Residential Risk Assessment  
Marine Terminal 1 South, Parcel 3 (Area A)**

$\text{LADD}^a(\text{mg/kg-d}) = \frac{C_{\text{soil}} \times \text{IRS} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}_{\text{carc}}}$		
$\text{ADD}^b(\text{mg/kg-d}) = \frac{C_{\text{soil}} \times \text{IRS} \times \text{CF} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}_{\text{non}}}$		
EXPOSURE FACTOR (units)	RME <sup>e</sup> Value	CT <sup>f</sup> Value
$C_{\text{soil}}$ = Chemical concentration in soil (mg/kg)	UCL <sub>90</sub> <sup>c</sup>	Arithmetic Mean
CF = Conversion factor (kg/mg)	10 <sup>-6</sup>	10 <sup>-6</sup>
IRS = Incidental Soil Ingestion Rate (mg/d)	Commercial Worker	50 <sup>d</sup>
	Utility/Excavation Worker	100 <sup>d</sup>
	Construction Worker	100 <sup>h</sup>
	Urban Resident – Adult	50 <sup>i</sup>
	Urban Resident – Child	100 <sup>i</sup>
EF = Exposure frequency (days/year)	Commercial Worker	250 <sup>d</sup>
	Utility/Excavation Worker	9 <sup>d</sup>
	Construction Worker	250 <sup>g</sup>
	Urban Resident – Adult/Child	40 <sup>i</sup>
ED = Exposure duration (year)	Commercial Worker	6 <sup>d</sup>
	Utility/Excavation Worker	0.5 <sup>d</sup>
	Construction Worker	0.5 <sup>h</sup>
	Urban Resident – Adult	4 <sup>i</sup>
	Urban Resident – Child	4 <sup>i</sup>
BW = Body weight (kg)	Adult	70 <sup>d</sup>
	Child	15 <sup>d</sup>
AT <sub>carc</sub> = Averaging time for carcinogens (days)	25,550 <sup>d</sup>	25,550 <sup>d</sup>
AT <sub>non</sub> = Averaging time for noncarcinogens (days)	ED (years) x 365 days/year	ED (years) x 365 days/year

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**Notes:**

- <sup>(a)</sup> Lifetime average daily dose, the intake value used to evaluate potential carcinogenic effects. For the residential evaluation, the adult and child intakes will be combined as recommended in Appendix A, Section A.0 of DEQ guidance (2000).
- <sup>(b)</sup> Average daily dose, the intake value used to evaluate potential noncarcinogenic effects.
- <sup>(c)</sup> An upper one-sided 90 percent confidence limit of the mean or the maximum concentration (whichever is lower) used for the RME.
- <sup>(d)</sup> DEQ (December 2000).
- <sup>(e)</sup> Reasonable maximum exposure.
- <sup>(f)</sup> Central Tendency.
- <sup>(g)</sup> EPA 2001.
- <sup>(h)</sup> Values consistent with development of Utility/Excavation Worker CT Values.
- <sup>(i)</sup> DEQ Proposed Urban Residential Exposure Factor Values.

**Table F-4 - Exposure Dose Equations and Exposure Factor Values:**  
**Dermal Contact with Soil**  
**Residual Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

$\text{LADD}^a \text{ (mg/kg-d)} = \frac{C_{\text{soil}} \times \text{AF} \times \text{SA} \times \text{DAF} \times \text{EF} \times \text{ED} \times \text{CF}}{\text{BW} \times \text{AT}_{\text{carc}}}$		
$\text{ADD}^b \text{ (mg/kg-d)} = \frac{C_{\text{soil}} \times \text{AF} \times \text{SA} \times \text{DAF} \times \text{EF} \times \text{ED} \times \text{CF}}{\text{BW} \times \text{AT}_{\text{non}}}$		
Exposure Factor (units)	RME <sup>c</sup> Value	CT <sup>f</sup> Value
$C_{\text{soil}}$ = Chemical concentration in soil (mg/kg)	UCL <sub>90</sub> <sup>c</sup>	Arithmetic Mean
AF = Soil-to-skin adherence factor (mg/cm <sup>2</sup> -event)		
Commercial Worker	0.08 <sup>d</sup>	0.08 <sup>d</sup>
Utility/Excavation Worker	1.0 <sup>d</sup>	0.3 <sup>d</sup>
Construction Worker	0.3 <sup>h</sup>	0.3 <sup>g</sup>
Urban Resident – Adult	0.07 <sup>j</sup>	0.01 <sup>j</sup>
Urban Resident – Child	0.2 <sup>j</sup>	0.04 <sup>j</sup>
SA = Skin surface area (cm <sup>2</sup> /day)		
Commercial Worker	4100 <sup>d</sup>	3200 <sup>d</sup>
Utility/Excavation Worker	4100 <sup>d</sup>	3200 <sup>d</sup>
Construction Worker	3300 <sup>h</sup>	3200 <sup>g</sup>
Urban Resident – Adult	5700 <sup>j</sup>	5700 <sup>j</sup>
Urban Resident – Child	2800 <sup>j</sup>	2800 <sup>j</sup>
DAF = Dermal absorption factor (unitless)	Chemical-specific	Chemical-specific
EF = Exposure frequency (days/year)		
Commercial Worker	250 <sup>d</sup>	250 <sup>d</sup>
Utility/Excavation Worker	9 <sup>d</sup>	9 <sup>d</sup>
Construction Worker	250 <sup>h</sup>	250 <sup>h</sup>
Urban Resident – Adult/Child	90 <sup>j</sup>	40 <sup>j</sup>
ED = Exposure duration (years)		
Commercial Worker	25 <sup>d</sup>	6 <sup>d</sup>
Utility/Excavation Worker	1 <sup>d</sup>	0.5 <sup>d</sup>
Construction Worker	1 <sup>h</sup>	0.5 <sup>j</sup>
Urban Resident – Adult	11 <sup>j</sup>	4 <sup>j</sup>
Urban Resident – Child	6 <sup>j</sup>	4 <sup>j</sup>
CF = Conversion factor (kg/mg)	10 <sup>-6</sup>	10 <sup>-6</sup>
BW = Body weight (kg)		
Adult	70 <sup>d</sup>	70 <sup>d</sup>
Child	15 <sup>d</sup>	15 <sup>d</sup>
AT <sub>carc</sub> = Averaging time for carcinogens (days)	25,550 <sup>d</sup>	25,550 <sup>d</sup>
AT <sub>non</sub> = Averaging time for noncarcinogens (days)	ED (years) x 365 days/year <sup>d</sup>	ED (years) x 365 days/year <sup>d</sup>

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**Notes:**

- (a) Lifetime absorbed daily dose, intake value used to evaluate potential carcinogenic effects. For the residential evaluation, the adult and child intakes will be combined as recommended in Appendix A, Section A.0 of DEQ guidance (2000).
- (b) Absorbed daily dose, intake value used to evaluate potential noncarcinogenic effects.
- (c) An upper one-sided 90 percent confidence limit of the mean or the maximum concentration (whichever is lower) was used for the RME.
- (d) DEQ (December 2000).
- (e) Reasonable maximum exposure.
- (f) Central Tendency.
- (g) Equal to DEQ Utility/Excavation Worker Values.
- (h) EPA 2001.
- (i) Values consistent with development of Utility/Excavation Worker CT Values.
- (j) DEQ Proposed Urban Residential Exposure Factor Values.

**Table F-5 - Exposure Dose Equations and Exposure Factor Values:  
Inhalation of Dust  
Residual Risk Assessment  
Marine Terminal 1 South, Parcel 3 (Area A)**

$\text{LADD}^a \text{ (mg/kg-d)} = \frac{\text{PM}_{10} \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{At}_{\text{cnc}}}$		
$\text{ADD}^b \text{ (mg/kg-d)} = \frac{\text{PM}_{10} \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{At}_{\text{non}}}$		
Exposure Factor (units)	RME <sup>f</sup> Value	CT <sup>g</sup> Value
$C_{\text{air}}^d$ = Chemical concentration in air (mg/m <sup>3</sup> )	UCL <sub>90</sub> <sup>c</sup>	Arithmetic Mean
IR = Inhalation rate (m <sup>3</sup> /day)		
Commercial Worker	15.2 <sup>e</sup>	15.2 <sup>g</sup>
Utility/Excavation Worker	15.2 <sup>e</sup>	15.2 <sup>g</sup>
Construction Worker	20 <sup>i</sup>	15.2 <sup>h</sup>
Urban Resident – Adult	20 <sup>k</sup>	20 <sup>k</sup>
Urban Resident – Child	8.3 <sup>k</sup>	8.3 <sup>k</sup>
EF = Exposure frequency (days/year)		
Commercial Worker	250 <sup>e</sup>	250 <sup>g</sup>
Utility/Excavation Worker	9 <sup>e</sup>	9 <sup>g</sup>
Construction Worker	250 <sup>i</sup>	250 <sup>j</sup>
Urban Resident – Adult/Child	350 <sup>k</sup>	350 <sup>k</sup>
ED = Exposure duration (years)		
Commercial Worker	25 <sup>e</sup>	6 <sup>e</sup>
Utility/Excavation Worker	1 <sup>e</sup>	0.5 <sup>e</sup>
Construction Worker	1 <sup>i</sup>	0.5 <sup>j</sup>
Urban Resident – Adult	11 <sup>k</sup>	4 <sup>k</sup>
Urban Resident – Child	6 <sup>k</sup>	4 <sup>k</sup>
BW = Body weight (kg)		
Adult	70 <sup>e</sup>	70 <sup>g</sup>
Child	15 <sup>e</sup>	15 <sup>g</sup>
AT <sub>cnc</sub> = Averaging time for carcinogens (days)	25,550 <sup>e</sup>	25,550 <sup>e</sup>
At <sub>non</sub> = Averaging time for noncarcinogens (days)	ED (years) x 365 days/year	ED (years) x 365 days/year

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**Notes:**

- (a) Lifetime average daily dose, intake value used to evaluate potential carcinogenic effects. For the residential evaluation, the adult and child intakes will be combined as recommended in Appendix A, Section A.0 of DEQ guidance (2000).
- (b) Average daily dose, intake value used to evaluate potential noncarcinogenic effects.
- (c) Upper one-sided 90 percent confidence limit of the mean or the maximum concentration (whichever is lower) was used for the RME.
- (d)  $C_{\text{air}}$  was derived from soil and groundwater concentrations using models discussed in DEQ guidance (1999 and 2000).
- (e) DEQ (December 2000).
- (f) Reasonable maximum exposure.
- (g) Central Tendency.
- (h) Equal to DEQ Utility/Excavation Worker Values.
- (i) EPA 2001.
- (j) Values consistent with development of Utility/Excavation Worker CT Values.
- (k) DEQ Proposed Urban Residential Exposure Factor Values.

**Table F-6 - Parcel 3 Human Health Toxicity Assessment**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

**Noncarcinogenic Toxicity Values**

Compound of Potential Concern	Oral RfD Citation	Oral RfD in mg/kg-day	Critical Effect	Uncertainty Factor	Inhalation RfD Citation	Inhalation RfD in mg/kg-day	Critical Effect	Uncertainty Factor
<b>Metals</b>								
Arsenic	IRIS	3.00E-04	Hyperpigmentation, keratosis and possible vascular complications	3	NA	NA	NA	NA

**Carcinogenic Toxicity Values**

Compound of Potential Concern	Oral CSF Citation	Oral CSF in (mg/kg-day) <sup>-1</sup>	Type of Cancer	Slope Factor/ Unit Risk				Weight of Evidence
				Weight of Evidence	Inhalation CSF Citation	Inhalation CSF in (mg/kg-day) <sup>-1</sup>	Type of Cancer	
<b>Semivolatile Organics</b>								
Benzo(a)pyrene	IRIS	7.3E+00	Stomach, larynx, and esophagus	B2	EPA	7.3E+00	NA	NA
<b>Metals</b>								
Arsenic	IRIS	1.5E+00	Skin	A	IRIS	1.5E+01	Lung	A

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**Notes:**

IRIS = Integrated Risk Information System (On-line Database).

EPA = US Environmental Protection Agency (EPA, 2002).

NA = Not Available or Not Applicable.

RfD = Reference Dose.

CSF = Carcinogenic slope factor.

A = Human Carcinogen.

B2 = Probable human carcinogen - based on sufficient evidence of carcinogenicity in animals.

**Table F-7 - Risk and Hazard Summary: By Exposure Pathway**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Exposure Scenario	COPC	RME Cancer Risk				CT Cancer Risk			
		Ingestion	Dermal	Inhalation of Dust	TOTAL	Ingestion	Dermal	Inhalation of Dust	TOTAL
Urban Resident	Benzo(a)pyrene	7.E-08	3.E-08	1.E-11	1.E-07	1.E-08	1.E-09	7.E-12	1.E-08
	Arsenic	4.E-06	3.E-07	8.E-09	4.E-06	2.E-07	6.E-09	1.E-09	2.E-07
	<b>TOTAL</b>	<b>4.E-06</b>	<b>4.E-07</b>	<b>8.E-09</b>	<b>4.E-06</b>	<b>2.E-07</b>	<b>7.E-09</b>	<b>1.E-09</b>	<b>2.E-07</b>
Commercial Worker	Benzo(a)pyrene	7.E-08	3.E-08	9.E-12	1.E-07	9.E-09	6.E-09	2.E-12	1.E-08
	Arsenic	4.E-06	4.E-07	5.E-09	4.E-06	2.E-07	2.E-08	3.E-10	2.E-07
	<b>TOTAL</b>	<b>4.E-06</b>	<b>4.E-07</b>	<b>5.E-09</b>	<b>4.E-06</b>	<b>2.E-07</b>	<b>3.E-08</b>	<b>3.E-10</b>	<b>2.E-07</b>
Excavation Worker	Benzo(a)pyrene	9.E-10	1.E-09	2.E-14	2.E-09	8.E-11	1.E-10	9.E-15	2.E-10
	Arsenic	4.E-08	9.E-09	9.E-12	5.E-08	1.E-09	3.E-10	1.E-12	2.E-09
	<b>TOTAL</b>	<b>4.E-08</b>	<b>1.E-08</b>	<b>9.E-12</b>	<b>5.E-08</b>	<b>1.E-09</b>	<b>4.E-10</b>	<b>1.E-12</b>	<b>2.E-09</b>
Construction Worker	Benzo(a)pyrene	2.E-08	7.E-09	8.E-13	2.E-08	2.E-09	3.E-09	2.E-13	5.E-09
	Arsenic	7.E-07	6.E-08	3.E-10	7.E-07	3.E-08	1.E-08	4.E-11	4.E-08
	<b>TOTAL</b>	<b>7.E-07</b>	<b>7.E-08</b>	<b>3.E-10</b>	<b>8.E-07</b>	<b>4.E-08</b>	<b>1.E-08</b>	<b>4.E-11</b>	<b>5.E-08</b>

Exposure Scenario	COPC	RME Hazard Index				CT Hazard Index			
		Ingestion	Dermal	Inhalation of Dust	TOTAL	Ingestion	Dermal	Inhalation of Dust	TOTAL
Urban Resident	Benzo(a)pyrene	--	--	--	--	--	--	--	--
	Arsenic	8.E-02	7.E-03	--	9.E-02	6.E-03	2.E-04	--	6.E-03
	<b>TOTAL</b>	<b>8.E-02</b>	<b>7.E-03</b>	--	<b>9.E-02</b>	<b>6.E-03</b>	<b>2.E-04</b>	--	<b>6.E-03</b>
Commercial Worker	Benzo(a)pyrene	--	--	--	--	--	--	--	--
	Arsenic	2.E-02	2.E-03	--	3.E-02	4.E-03	6.E-04	--	5.E-03
	<b>TOTAL</b>	<b>2.E-02</b>	<b>2.E-03</b>	--	<b>3.E-02</b>	<b>4.E-03</b>	<b>6.E-04</b>	--	<b>5.E-03</b>
Excavation Worker	Benzo(a)pyrene	--	--	--	--	--	--	--	--
	Arsenic	6.E-03	1.E-03	--	7.E-03	4.E-04	1.E-04	--	5.E-04
	<b>TOTAL</b>	<b>6.E-03</b>	<b>1.E-03</b>	--	<b>7.E-03</b>	<b>4.E-04</b>	<b>1.E-04</b>	--	<b>5.E-04</b>
Construction Worker	Benzo(a)pyrene	--	--	--	--	--	--	--	--
	Arsenic	1.E-01	1.E-02	--	1.E-01	1.E-02	3.E-03	--	1.E-02
	<b>TOTAL</b>	<b>1.E-01</b>	<b>1.E-02</b>	--	<b>1.E-01</b>	<b>1.E-02</b>	<b>3.E-03</b>	--	<b>1.E-02</b>

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**Note:**

1. Shaded boxes indicate exposure scenarios that exceed DEQ's acceptable risk or hazard targets.

**Table F-8 - Parcel 3 Urban Resident Residual Risk Calculations**  
**Soil Ingestion**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	Soil EPC in mg/kg		Hazard Intake in mg/kg-day		Hazard Quotient		Cancer Intake in mg/kg-day		Cancer Risk	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs										
Benzo(a)pyrene	2.9E-02	2.9E-02	9.5E-08	2.1E-08	--	--	9.8E-09	1.3E-09	7.1E-08	9.8E-09
Metals										
Arsenic	7.5E+00	2.4E+00	2.5E-05	1.8E-06	8.2E-02	5.8E-03	2.5E-06	1.1E-07	3.8E-06	1.7E-07
TOTAL HAZARD INDEX					8.E-02	6.E-03	TOTAL CANCER RISK		4.E-06	2.E-07

Notes:  
RME = Reasonable Maximum Exposure.  
CT = Central Tendency.  
EPC = Exposure Point Concentration.

**Table F-8 - Parcel 3 Urban Resident Residual Risk Calculations**  
**Dermal Contact with Soil**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	ABS	Soil EPC in mg/kg		Hazard Intake in mg/kg-day		Hazard Quotient		Cancer Intake in mg/kg-day		Cancer Risk	
		RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs											
Benzo(a)pyrene	0.13	2.9E-02	2.9E-02	3.5E-08	3.1E-09	--	--	3.8E-09	2.0E-10	2.8E-08	1.4E-09
Metals											
Arsenic	0.03	7.5E+00	2.4E+00	2.1E-06	5.9E-08	6.9E-03	2.0E-04	2.3E-07	3.7E-09	3.4E-07	5.6E-09
TOTAL HAZARD INDEX						7.E-03	2.E-04	TOTAL CANCER RISK		4.E-07	7.E-09

## Notes:

ABS = Dermal Absorption Factor (EPA, 1998).

RME = Reasonable Maximum Exposure.

CT = Central Tendency.

EPC = Exposure Point Concentration.

**Table F-8 - Parcel 3 Urban Resident Residual Risk Calculations**  
**Fugitive Dust Inhalation**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	PEF in m <sup>3</sup> /kg	Outdoor Air EPC in mg/m <sup>3</sup>		Hazard Intake in mg/kg-day		Hazard Quotient		Cancer Intake in mg/kg-day		Cancer Risk	
		RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs											
Benzo(a)pyrene	1.32E+09	2.2E-11	2.2E-11	1.2E-11	1.2E-11	-	-	1.9E-12	1.0E-12	1.4E-11	7.4E-12
Metals											
Arsenic	1.32E+09	5.7E-09	1.8E-09	3.0E-09	9.6E-10	-	-	5.0E-10	8.4E-11	7.5E-09	1.3E-09
<b>TOTAL HAZARD INDEX</b>						<b>0.E+00</b>	<b>0.E+00</b>	<b>TOTAL CANCER RISK</b>		<b>8.E-09</b>	<b>1.E-09</b>

Notes:  
 Outdoor Air EPC = Soil EPC (See Table 4)/PEF.  
 PEF = Particulate Emission Factor.  
 RME = Reasonable Maximum Exposure.  
 CT = Central Tendency.  
 EPC = Exposure Point Concentration.

**Table F-8 - Urban Resident Residual Risk Calculations**  
**RME and CT Risk and Hazard Summary: By COPC**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Exposure Scenario	COPC	Exposure Point Concentration in mg/kg	RME Cancer Risk				Exposure Point Concentration in mg/kg	CT Cancer Risk			
			Ingestion	Dermal	Inhalation of Dust	TOTAL		Ingestion	Dermal	Inhalation of Dust	TOTAL
Urban Resident	Benzo(a)pyrene	2.9E-02	7.E-08	3.E-08	1.E-11	1.E-07	2.9E-02	1.E-08	1.E-09	7.E-12	1.E-08
	Arsenic	7.5E+00	4.E-06	3.E-07	8.E-09	4.E-06	2.4E+00	2.E-07	6.E-09	1.E-09	2.E-07
	<b>TOTAL</b>		<b>4.E-06</b>	<b>4.E-07</b>	<b>8.E-09</b>	<b>4.E-06</b>		<b>2.E-07</b>	<b>7.E-09</b>	<b>1.E-09</b>	<b>2.E-07</b>
Exposure Scenario	COPC	Exposure Point Concentration in mg/kg	RME Hazard Index				Exposure Point Concentration in mg/kg	CT Hazard Index			
			Ingestion	Dermal	Inhalation of Dust	TOTAL		Ingestion	Dermal	Inhalation of Dust	TOTAL
Urban Resident	Benzo(a)pyrene	2.9E-02	--	--	--	--	2.9E-02	--	--	--	--
	Arsenic	7.5E+00	8.E-02	7.E-03	--	9.E-02	2.4E+00	6.E-03	2.E-04	--	6.E-03
	<b>TOTAL</b>		<b>8.E-02</b>	<b>7.E-03</b>	<b>--</b>	<b>9.E-02</b>		<b>6.E-03</b>	<b>2.E-04</b>	<b>--</b>	<b>6.E-03</b>

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**Note:**

Shaded boxes indicate COPC that exceeds DEQ acceptable risk target.

**Table F-9 - Parcel 3 Commercial Worker Residual Risk Calculations**  
**Soil Ingestion**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	Soil EPC in mg/kg		Hazard Intake in mg/kg-day		Hazard Quotient		Cancer Intake in mg/kg-day		Cancer Risk	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs										
Benzo(a)pyrene	2.9E-02	2.9E-02	2.8E-08	1.4E-08	--	--	1.0E-08	1.2E-09	7.4E-08	8.9E-09
Metals										
Arsenic	7.5E+00	2.4E+00	7.3E-06	1.2E-06	2.4E-02	3.9E-03	2.6E-06	1.0E-07	3.9E-06	1.5E-07
TOTAL HAZARD INDEX					2.E-02	4.E-03	TOTAL CANCER RISK		4.E-06	2.E-07

Notes:  
RME = Reasonable Maximum Exposure.  
CT = Central Tendency.  
EPC = Exposure Point Concentration.

**Table F-9 - Parcel 3 Commercial Worker Residual Risk Calculations**  
**Dermal Contact with Soil**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	ABS	Soil EPC in mg/kg		Hazard Intake in mg/kg-day		Hazard Quotient		Cancer Intake in mg/kg-day		Cancer Risk	
		RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
<b>PAHs</b>											
Benzo(a)pyrene	0.13	2.9E-02	2.9E-02	1.2E-08	9.4E-09	-	-	4.3E-09	8.1E-10	3.2E-08	5.9E-09
<b>Metals</b>											
Arsenic	0.03	7.5E+00	2.4E+00	7.2E-07	1.8E-07	2.4E-03	6.0E-04	2.6E-07	1.5E-08	3.9E-07	2.3E-08
<b>TOTAL HAZARD INDEX</b>						<b>2.E-03</b>	<b>6.E-04</b>	<b>TOTAL CANCER RISK</b>		<b>4.E-07</b>	<b>3.E-08</b>

**Notes:**

ABS = Dermal Absorption Factor (EPA, 1998).

RME = Reasonable Maximum Exposure.

CT = Central Tendency.

EPC = Exposure Point Concentration.

**Table F-9 - Parcel 3 Commercial Worker Residual Risk Calculations (Surface Soil)**

Sheet 3 of 4

**Fugitive Dust Inhalation**

**Residential Risk Assessment**

**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	PEF in m <sup>3</sup> /kg	Outdoor Air EPC in mg/m <sup>3</sup>		Hazard Intake in mg/kg-day		Hazard Quotient		Cancer Intake in mg/kg-day		Cancer Risk	
		RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs											
Benzo(a)pyrene	1.32E+09	2.2E-11	2.2E-11	3.3E-12	3.3E-12	--	--	1.2E-12	2.8E-13	8.5E-12	2.0E-12
Metals											
Arsenic	1.32E+09	5.7E-09	1.8E-09	8.5E-10	2.7E-10	--	--	3.0E-10	2.3E-11	4.5E-09	3.5E-10
TOTAL HAZARD INDEX						0.E+00	0.E+00	TOTAL CANCER RISK		5.E-09	3.E-10

**Notes:**

Outdoor Air EPC = Soil EPC (See Table 4)/PEF.

PEF = Particulate Emission Factor.

RME = Reasonable Maximum Exposure.

CT = Central Tendency.

EPC = Exposure Point Concentration.

Table F-9 - Parcel 3 Commercial Worker Residual Risk Calculations (Surface Soil)

RME and CT Risk and Hazard Summary: By COPC

Residential Risk Assessment

Marine Terminal 1 South, Parcel 3 (Area A)

Exposure Scenario	COPC	Exposure Point Concentration in mg/kg	RME Cancer Risk				Exposure Point Concentration in mg/kg	CT Cancer Risk			
			Ingestion	Dermal	Inhalation of Dust	TOTAL		Ingestion	Dermal	Inhalation of Dust	TOTAL
Commercial Worker	Benzo(a)pyrene	2.9E-02	7.E-08	3.E-08	9.E-12	1.E-07	2.9E-02	9.E-09	6.E-09	2.E-12	1.E-08
	Arsenic	7.5E+00	4.E-06	4.E-07	5.E-09	4.E-06	2.4E+00	2.E-07	2.E-08	3.E-10	2.E-07
	<b>TOTAL</b>		<b>4.E-06</b>	<b>4.E-07</b>	<b>5.E-09</b>	<b>4.E-06</b>		<b>2.E-07</b>	<b>3.E-08</b>	<b>3.E-10</b>	<b>2.E-07</b>

Exposure Scenario	COPC	Exposure Point Concentration in mg/kg	RME Hazard Index				Exposure Point Concentration in mg/kg	CT Hazard Index			
			Ingestion	Dermal	Inhalation of Dust	TOTAL		Ingestion	Dermal	Inhalation of Dust	TOTAL
Commercial Worker	Benzo(a)pyrene	2.9E-02	--	--	--	--	2.9E-02	--	--	--	--
	Arsenic	7.5E+00	2.E-02	2.E-03	--	3.E-02	2.4E+00	4.E-03	6.E-04	--	5.E-03
	<b>TOTAL</b>		<b>2.E-02</b>	<b>2.E-03</b>	<b>--</b>	<b>3.E-02</b>		<b>4.E-03</b>	<b>6.E-04</b>	<b>--</b>	<b>5.E-03</b>

F:\DATA\Jobs\Port of Portland\15230 Term 1 Support\15230-05 Parcel 3\Construction Report\Residual Risk Section\Appendix Tables\Table F-09

## Note:

Shaded boxes indicate COPC that exceeds DEQ acceptable risk target.

**Table F-10 - Parcel 3 Excavation Worker Residual Risk Calculations (Total Soil)**  
**Soil Ingestion**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	Soil EPC in mg/kg		Hazard Intake in mg/kg-day		Hazard Quotient		Cancer Intake in mg/kg-day		Cancer Risk	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs										
Benzo(a)pyrene	5.1E-02	4.2E-02	8.6E-09	1.5E-09	--	--	1.2E-10	1.1E-11	9.0E-10	7.7E-11
Metals										
Arsenic	9.9E+00	3.2E+00	1.7E-06	1.1E-07	5.6E-03	3.8E-04	2.4E-08	8.1E-10	3.6E-08	1.2E-09
TOTAL HAZARD INDEX					6.E-03	4.E-04	TOTAL CANCER RISK		4.E-08	1.E-09

**Notes:**

RME = Reasonable Maximum Exposure.

CT = Central Tendency.

EPC = Exposure Point Concentration.

**Table A-10 - Parcel 3 Excavation Worker Residual Risk Calculations (Total Soil)**  
**Dermal Contact with Soil**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	ABS	Soil EPC in mg/kg		Hazard Intake in mg/kg-day		Hazard Quotient		Cancer Intake in mg/kg-day		Cancer Risk	
		RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs											
Benzo(a)pyrene	0.13	5.1E-02	4.2E-02	9.6E-09	1.8E-09	-	-	1.4E-10	1.3E-11	1.0E-09	9.6E-11
Metals											
Arsenic	0.03	9.9E+00	3.2E+00	4.3E-07	3.2E-08	1.4E-03	1.1E-04	6.1E-09	2.3E-10	9.2E-09	3.5E-10
TOTAL HAZARD INDEX						1.E-03	1.E-04	TOTAL CANCER RISK		1.E-08	4.E-10

**Notes:**

RME = Reasonable Maximum Exposure.

CT = Central Tendency.

EPC = Exposure Point Concentration.

**Table F-10 - Parcel 3 Excavation Worker Residual Risk Calculations (Total Soil)**  
**Fugitive Dust Inhalation**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	PEF in $m^3/kg$	Air EPC in $mg/3$		Hazard Intake in $mg/kg\text{-day}$		Hazard Quotient		Cancer Intake in $mg/kg\text{-day}$		Cancer Risk	
		RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs											
Benzo(a)pyrene	1.32E+09	3.9E-11	3.2E-11	2.1E-13	1.7E-13	--	--	3.0E-15	1.2E-15	2.2E-14	8.9E-15
Metals											
Arsenic	1.32E+09	7.5E-09	2.4E-09	4.0E-11	1.3E-11	--	--	5.7E-13	9.3E-14	8.6E-12	1.4E-12
TOTAL HAZARD INDEX						0.E+00	0.E+00	TOTAL CANCER RISK		9.E-12	1.E-12

## Notes:

RME = Reasonable Maximum Exposure.

CT = Central Tendency.

EPC = Exposure Point Concentration.

**Table F-11 - Parcel 3 Construction Worker Residual Risk Calculations (Total Soil)**  
**Soil Ingestion**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	Soil EPC in mg/kg		Hazard Intake in mg/kg-day		Hazard Quotient		Cancer Intake in mg/kg-day		Cancer Risk	
	RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs										
Benzo(a)pyrene	5.1E-02	4.2E-02	1.6E-07	4.1E-08	--	--	2.4E-09	2.9E-10	1.7E-08	2.1E-09
Metals										
Arsenic	9.9E+00	3.2E+00	3.2E-05	3.1E-06	1.1E-01	1.0E-02	4.6E-07	2.2E-08	6.9E-07	3.4E-08
TOTAL HAZARD INDEX					1.E-01	1.E-02	TOTAL CANCER RISK		7.E-07	4.E-08

Notes:  
RME = Reasonable Maximum Exposure.  
CT = Central Tendency.  
EPC = Exposure Point Concentration.

**Table F-11 - Parcel 3 Construction Worker Residual Risk Calculations (Total Soil)**  
**Dermal Contact with Soil**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Compounds of Potential Concern	ABS	Soil EPC in mg/kg		Hazard Intake in mg/kg-day		Hazard Quotient		Cancer Intake in mg/kg-day		Cancer Risk	
		RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs											
Benzo(a)pyrene	0.13	5.1E-02	4.2E-02	6.4E-08	5.1E-08	-	--	9.2E-10	3.7E-10	6.7E-09	2.7E-09
Metals											
Arsenic	0.03	9.9E+00	3.2E+00	2.9E-06	9.0E-07	9.6E-03	3.0E-03	4.1E-08	6.4E-09	6.2E-08	9.7E-09
TOTAL HAZARD INDEX						1.E-02	3.E-03	TOTAL CANCER RISK		7.E-08	1.E-08

**Notes:**

ABS = Dermal Absorption Factor (EPA, 1998).

RME = Reasonable Maximum Exposure.

CT = Central Tendency.

EPC = Exposure Point Concentration.

Table F-11 - Parcel 3 Construction Worker Residual Risk Calculations (Total Soil)

Fugitive Dust Inhalation

Residential Risk Assessment

Marine Terminal 1 South, Parcel 3 (Area A)

Compounds of Potential Concern	PEF in $\text{m}^3/\text{kg}$	Outdoor Air EPC in $\text{mg}/\text{m}^3$		Hazard Intake in $\text{mg}/\text{kg}\cdot\text{day}$		Hazard Quotient		Cancer Intake in $\text{mg}/\text{kg}\cdot\text{day}$		Cancer Risk	
		RME	CT	RME	CT	RME	CT	RME	CT	RME	CT
PAHs											
Benzo(a)pyrene	1.32E+09	3.9E-11	3.2E-11	7.6E-12	4.7E-12	--	--	1.1E-13	3.4E-14	7.9E-13	2.5E-13
Metals											
Arsenic	1.32E+09	7.5E-09	2.4E-09	1.5E-09	3.6E-10	--	--	2.1E-11	2.6E-12	3.1E-10	3.9E-11
TOTAL HAZARD INDEX						0.E+00	0.E+00	TOTAL CANCER RISK		3.E-10	4.E-11

## Notes:

Outdoor Air EPC = Soil EPC (See Table 4)/PEF.

PEF = Particulate Emission Factor.

RME = Reasonable Maximum Exposure.

CT = Central Tendency.

EPC = Exposure Point Concentration.

**Table F-10 - Parcel 3 Excavation Worker Residual Risk Calculations (Total Soil)**  
**RME and CT Risk and Hazard Summary: By COPC**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Exposure Scenario	COPC	Exposure Point Concentration in mg/kg	RME Cancer Risk				Exposure Point Concentration in mg/kg	CT Cancer Risk			
			Ingestion	Dermal	Inhalation of Dust	TOTAL		Ingestion	Dermal	Inhalation of Dust	TOTAL
Excavation Worker	Benzo(a)pyrene	5.1E-02	9.E-10	1.E-09	2.E-14	2.E-09	4.2E-02	8.E-11	1.E-10	9.E-15	2.E-10
	Arsenic	9.9E+00	4.E-08	9.E-09	9.E-12	5.E-08	3.2E+00	1.E-09	3.E-10	1.E-12	2.E-09
	<b>TOTAL</b>		<b>4.E-08</b>	<b>1.E-08</b>	<b>9.E-12</b>	<b>5.E-08</b>		<b>1.E-09</b>	<b>4.E-10</b>	<b>1.E-12</b>	<b>2.E-09</b>

Exposure Scenario	COPC	Exposure Point Concentration in mg/kg	RME Hazard Index				Exposure Point Concentration in mg/kg	CT Hazard Index			
			Ingestion	Dermal	Inhalation of Dust	TOTAL		Ingestion	Dermal	Inhalation of Dust	TOTAL
Excavation Worker	Benzo(a)pyrene	5.1E-02	--	--	--	--	4.2E-02	--	--	--	--
	Arsenic	9.9E+00	6.E-03	1.E-03	--	7.E-03	3.2E+00	4.E-04	1.E-04	--	5.E-04
	<b>TOTAL</b>		<b>6.E-03</b>	<b>1.E-03</b>	<b>--</b>	<b>7.E-03</b>		<b>4.E-04</b>	<b>1.E-04</b>	<b>--</b>	<b>5.E-04</b>

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**Note:**

Shaded boxes indicate COPC that exceeds DEQ acceptable risk target.

**Table F-11 - Parcel 3 Construction Worker Residual Risk Calculations (Total Soil)**  
**RME and CT Risk Summary: By COPC**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Exposure Scenario	COPC	Exposure Point Concentration in mg/kg	RME Cancer Risk				Exposure Point Concentration in mg/kg	CT Cancer Risk			
			Ingestion	Dermal	Inhalation of Dust	TOTAL		Ingestion	Dermal	Inhalation of Dust	TOTAL
Construction Worker	Benzo(a)pyrene	5.1E-02	2.E-08	7.E-09	8.E-13	2.E-08	4.2E-02	2.E-09	3.E-09	2.E-13	5.E-09
	Arsenic	9.9E+00	7.E-07	6.E-08	3.E-10	7.E-07	3.2E+00	3.E-08	1.E-08	4.E-11	4.E-08
	<b>TOTAL</b>		<b>7.E-07</b>	<b>7.E-08</b>	<b>3.E-10</b>	<b>8.E-07</b>		<b>4.E-08</b>	<b>1.E-08</b>	<b>4.E-11</b>	<b>5.E-08</b>

Exposure Scenario	COPC	Exposure Point Concentration in mg/kg	RME Hazard Index				Exposure Point Concentration in mg/kg	CT Hazard Index			
			Ingestion	Dermal	Inhalation of Dust	TOTAL		Ingestion	Dermal	Inhalation of Dust	TOTAL
Construction Worker	Benzo(a)pyrene	5.1E-02	--	--	--	--	4.2E-02	--	--	--	--
	Arsenic	9.9E+00	1.E-01	1.E-02	--	1.E-01	3.2E+00	1.E-02	3.E-03	--	1.E-02
	<b>TOTAL</b>		<b>1.E-01</b>	<b>1.E-02</b>	<b>--</b>	<b>1.E-01</b>		<b>1.E-02</b>	<b>3.E-03</b>	<b>--</b>	<b>1.E-02</b>

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**Note:**

Shaded boxes indicate COPC that exceeds DEQ acceptable risk target.

**Table F-12 - Analytical Results for Surface Soil Samples**  
**Residential Risk Assessment**  
**Marine Terminal 1 South, Parcel 3 (Area A)**

Area	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sample ID	5108-001027-068	5108-001030-079	5108-001027-078	5108-001028-086	5108-000921-080	5108-000821-086	5108-000925-079	5108-001027-077	5108-001106-095	5108-001108-090				
Station	B-100	B-104	B-105	B-110	B-71	B-73	B-74	B-76a	B-97	B-99	TP-33 (2-3)	TP-5 (2-3)	TP-6 (2-3)	TP-1 (2-3)
Sampling Date	10/27/2000	10/30/2000	10/27/2000	10/26/2000	9/21/2000	9/21/2000	9/25/2000	10/27/2000	11/06/2000	11/06/2000	10/9/2002	10/9/2002	10/9/2002	10/9/2002
Depth in Feet	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3	2 to 3	2 to 3	2 to 3	2 to 3
<b>Metals in mg/kg</b>														
Antimony														
Arsenic		1.64	1 U	1 U				1 U	7.53	3.73				
Beryllium														
Cadmium														
Chromium														
Copper														
Lead		28.1	1 U	1 U				1 U	22.4	9.21				
Mercury														
Nickel														
Selenium														
Silver														
Thallium														
Zinc														
TCLP-Lead														
<b>PAHs in mg/kg</b>														
Benzo(a)anthracene	0.05 U			1 U	0.0134 U	0.0134 U	0.0292	0.05 U	0.05 U	0.05 U	0.0179	0.0134 U	0.0134 U	0.0134 U
Benzo(a)pyrene	0.05 U			1 U	0.0134 U	0.0134 U	0.0292	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Benzo(b)fluoranthene	0.05 U			1 U	0.0134 U	0.0134 U	0.0189	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Benzo(k)fluoranthene	0.05 U			1 U	0.0134 U	0.0134 U	0.0226	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Chrysene	0.05 U			1 U	0.0134 U	0.0134 U	0.027	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Dibenz(ah)anthracene	0.05 U			1 U	0.0134 U	0.0134 U	0.01 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Indeno(1,2,3-cd)pyrene	0.05 U			1 U	0.0134 U	0.0134 U	0.0131	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Acenaphthene	0.05 U			1 U	0.0134 U	0.0134 U	0.01 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Acenaphthylene	0.05 U			1 U	0.0134 U	0.0134 U	0.01 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Anthracene	0.05 U			1 U	0.0134 U	0.0134 U	0.01 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Benzo(ghi)perylene	0.05 U			1 U	0.0134 U	0.0134 U	0.016	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Fluoranthene	0.05 U			1 U	0.0134 U	0.0134 U	0.0576	0.05 U	0.05 U	0.05 U	0.0106	0.0134 U	0.0134 U	0.0134 U
Fluorene	0.05 U			1 U	0.0134 U	0.0134 U	0.01 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Naphthalene	0.05 U			1 U	0.0134 U	0.0134 U	0.01 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Phenanthrene	0.05 U			1 U	0.0134 U	0.0134 U	0.0241	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U	0.0134 U
Pyrene	0.05 U			1 U	0.0134 U	0.0134 U	0.0663	0.05 U	0.05 U	0.05 U	0.0220	0.0134 U	0.0134 U	0.0134 U
Total PAHs	0.05 U			1 U	0.0134 U	0.0134 U	0.304	0.05 U	0.05 U	0.05 U	0.0733	0.0134 U	0.0134 U	0.0134 U

F:\DATA\Aspen\Port of Portland\1520-Term 1 Support\1520-06 Parcel 3\Construction Report\Residential Risk Assessment\Appendix Tables\Table F-12

Note:  
 U = Not Detected at Reported Detection Limit.

Table F-13 - Analytical Results for Surface Soil Samples  
Residential Risk Assessment  
Marine Terminal 1 South, Parcel 3 (Area A)

Sheet 1 of 3

Area Sample ID Station Sampling Date Depth in Feet	A 5106-001027-0 B-100 10/27/2000 10	A 5106-001027-068 B-100 10/27/2000 2.5	A 5106-001028-064 B-101 10/26/2000 10	A 5106-001028-083 B-102 10/26/2000 10	A 5106-001027-074 B-103 10/27/2000 10	A 5106-001030-079 B-104 10/30/2000 2.5	A 5106-001027-078 B-105 10/27/2000 2.5	A 5106-001027-067 B-107 10/27/2000 4	A B11 (B-11) B-11 3/26/98 9-11	A 5106-001028-058 B-110 10/26/2000 2.5	A 4876-000313-043 B-41 3/13/2000 5	A 4876-000316-067 B-46 3/16/2000 12.5	A 4876-000316-079 B-48 3/16/2000 11	A 5106-000921-061 B-71 9/21/2000 10	A 5106-000921-060 B-71 9/21/2000 2.5
Metals in mg/kg															
Antimony									0.5 U						
Arsenic						1.64	1 U	1.35	11.2	1 U					
Beryllium									0.6 U						
Cadmium									1.33						
Chromium									28.4						
Copper									17.1						
Lead						28.1	1 U	2.73	23.8	1 U					
Mercury									0.05 U						
Nickel									15.2						
Selenium									0.5 U						
Silver									1 U						
Thallium									0.5 U						
Zinc									70.5						
TCLP-Lead															
PAHs in mg/kg															
Benzo(a)anthracene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.062	0.074	0.139 R	0.0203	0.0134 U
Benzo(a)pyrene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.068	0.068	0.169 R	0.0157	0.0134 U
Benzo(b)fluoranthene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.055		1 U	0.069	0.064	0.204 R	0.0134 U	0.0134 U
Benzo(k)fluoranthene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.019	0.023	0.047 R	0.0134 U	0.0134 U
Chrysene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.08	0.073	0.198 R	0.0223	0.0134 U
Dibenz(ah)anthracene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.015 U	0.014 U	0.035 R	0.0134 U	0.0134 U
Indeno(1,2,3-cd)pyrene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.034	0.042	0.117 R	0.0134 U	0.0134 U
Acenaphthene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.053	0.014 U	0.01 R	0.0134 U	0.0134 U
Acenaphthylene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.015 U	0.015	0.06 R	0.0134 U	0.0134 U
Anthracene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.031	0.019	0.032 R	0.0134 U	0.0134 U
Benzo(ghi)perylene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.049	0.058	0.171 R	0.0134 U	0.0134 U
Fluoranthene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.109	0.101	0.219 R	0.0237	0.0134 U
Fluorene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.044	0.014 U	0.015 R	0.0134 U	0.0134 U
Naphthalene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.034	0.026	0.082 R	0.0134 U	0.0134 U
Phenanthrene	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U			0.05 U		1 U	0.178	0.048	0.21 R	0.0175	0.0134 U
Pyrene	0.05 U	0.05 U	0.05 U	0.075	0.05 U			0.05 U		1 U	0.195	0.151	0.293 R	0.0388	0.0134 U
Total PAHs	0.05 U	0.05 U	0.05 U	0.135	0.05 U			0.145		1 U	1.085	0.81	1.991 R	0.1383	0.0134 U

Table F-13 - Analytical Results for Surface Soil Samples  
Residential Risk Assessment  
Marine Terminal 1 South, Parcel 3 (Area A)

Sheet 2 of 3

Area	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sample ID	5106-000921-067	5106-000921-086	5106-000925-080	5106-000925-079	5106-001027-077	B8 (9-11)	5106-001030-082	5106-001106-097	5106-001106-095	5106-001106-098	5106-001106-092	5106-001106-090	TP-33 (2-3)	TP-5 (2-3)	TP-6 (2-3)
Station	B-73	B-73	B-74	B-74	B-78a	B-8	B-84	B-97	B-97	B-97	B-99	B-99	TP-33 (2-3)	TP-5 (2-3)	TP-6 (2-3)
Sampling Date	9/21/2000	9/21/2000	9/25/2000	9/25/2000	10/27/2000	3/26/98	10/30/2000	11/06/2000	11/08/2000	11/06/2000	11/06/2000	11/06/2000	10/9/2002	10/9/2002	10/9/2002
Depth in Feet	12.5	2.5	12.5	2.5	2.5	9-11	10	10	3	5	10	3	2 to 3	2 to 3	2 to 3
Metals in mg/kg															
Antimony						0.5 U									
Arsenic					1 U	1.42			7.53			3.73			
Beryllium						0.5 U									
Cadmium						0.5 U									
Chromium						14.3									
Copper						9.34									
Lead					1 U	10 U			22.4			9.21			
Mercury						0.05 U									
Nickel						13.8									
Selenium						0.5 U									
Silver						1 U									
Thallium						0.5 U									
Zinc						35.2									
TCLP-Lead															
PAHs in mg/kg															
Benzo(a)anthracene	0.0134 U	0.0134 U	0.01 U	0.0292	0.05 U		0.13	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0179	0.0134 U	0.0134 U
Benzo(a)pyrene	0.0134 U	0.0134 U	0.01 U	0.0292	0.05 U		0.185	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Benzo(b)fluoranthene	0.0134 U	0.0134 U	0.01 U	0.0189	0.05 U		0.21	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Benzo(k)fluoranthene	0.0134 U	0.0134 U	0.01 U	0.0228	0.05 U		0.065	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Chrysene	0.0134 U	0.0134 U	0.01 U	0.027	0.05 U		0.13	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0138	0.0134 U	0.0134 U
Dibenz(ah)anthracene	0.0134 U	0.0134 U	0.01 U	0.01 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Indeno(1,2,3-cd)pyrene	0.0134 U	0.0134 U	0.01 U	0.0131	0.05 U		0.11	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Acenaphthene	0.0134 U	0.0134 U	0.01 U	0.01 U	0.05 U		0.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Acenaphthylene	0.0134 U	0.0134 U	0.01 U	0.01 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Anthracene	0.0134 U	0.0134 U	0.01 U	0.01 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Benzo(ghi)perylene	0.0134 U	0.0134 U	0.01 U	0.016	0.05 U		0.165	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Fluoranthene	0.0134 U	0.0134 U	0.01 U	0.0578	0.05 U		0.295	0.05 U	0.05 U	0.06	0.05 U	0.05 U	0.0186	0.0134 U	0.0134 U
Fluorene	0.0134 U	0.0134 U	0.01 U	0.01 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Naphthalene	0.0134 U	0.0134 U	0.01 U	0.01 U	0.05 U		0.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Phenanthrene	0.0134 U	0.0134 U	0.01 U	0.0241	0.05 U		0.13	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0134 U	0.0134 U	0.0134 U
Pyrene	0.0134 U	0.0134 U	0.01 U	0.0683	0.05 U		0.35	0.05 U	0.05 U	0.055	0.05 U	0.05 U	0.022	0.0134 U	0.0134 U
Total PAHs	0.0134 U	0.0134 U	0.01 U	0.304	0.05 U		1.77	0.05 U	0.05 U	0.115	0.05 U	0.05 U	0.0733	0.0134 U	0.0134 U

Table F-13 - Analytical Results for Surface Soil Samples  
Residential Risk Assessment  
Marine Terminal 1 South, Parcel 3 (Area A)

Sheet 3 of 3

Area	A	A	A	A	A	A	A	A	A	A	A
Sample ID	TP-1 (2-3)	TP-3 (2-3)	A-5/S-1	A-6/S-1	A-6/S-2	A-7/S-1	A-7/S-2	A-7/S-3	A-7/S-4	A-8/S-1	A-9/S-3
Station	10/9/2002	10/9/2002	1/8/2003	1/14/2003	1/14/2003	1/14/2003	1/14/2003	1/14/2003	1/14/2003	1/14/2003	1/14/2003
Sampling Date	2 to 3	2 to 3	10	4.2	4.2	3.2	3.2	3.2	3.2	5.2	5.2
Depth In Feet											
<b>Metals in mg/kg</b>											
Antimony											
Arsenic											
Beryllium											
Cadmium											
Chromium											
Copper											
Lead											
Mercury											
Nickel											
Selenium											
Silver											
Thallium											
Zinc											
TCLP-Lead											
<b>PAHs in mg/kg</b>											
Benzo(a)anthracene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0287	0.0517	0.0134 U	0.0134 U	0.0134 U	0.0965	0.067 U
Benzo(a)pyrene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0266	0.0469	0.0134 U	0.0134 U	0.0134 U	0.0806	0.0768
Benzo(b)fluoranthene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0268 U	0.0457	0.0134 U	0.0134 U	0.0134 U	0.067 U	0.067
Benzo(k)fluoranthene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0268 U	0.0403	0.0134 U	0.0134 U	0.0134 U	0.067 U	0.067 U
Chrysene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.035	0.0667	0.0134 U	0.0134 U	0.0134 U	0.11	0.0825
Dibenz(ah)anthracene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0268 U	0.0268 U	0.0134 U	0.0134 U	0.0134 U	0.067 U	0.067 U
Indeno(1,2,3-cd)pyrene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0268 U	0.0283	0.0134 U	0.0134 U	0.0134 U	0.067 U	0.067 U
Acenaphthone	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0268 U	0.0268 U	0.0134 U	0.0134 U	0.0134 U	0.067 U	0.067 U
Acenaphthylene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0268 U	0.0268 U	0.0134 U	0.0134 U	0.0134 U	0.067 U	0.067 U
Anthracene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0268 U	0.0273	0.0134 U	0.0134 U	0.0134 U	0.067 U	0.067 U
Benzo(ghi)perylene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0268 U	0.0347	0.0134 U	0.0134 U	0.0134 U	0.08	0.067 U
Fluoranthene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0664	0.166	0.0154	0.0134 U	0.0134 U	0.561	0.116
Fluorene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0268 U	0.0268 U	0.0134 U	0.0134 U	0.0134 U	0.067 U	0.067 U
Naphthalene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0268 U	0.0268 U	0.0134 U	0.0134 U	0.0134 U	0.067 U	0.067 U
Phenanthrene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0618	0.112	0.0134 U	0.0134 U	0.0134 U	0.365	0.0899
Pyrene	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.0689	0.161	0.0184	0.0134 U	0.0134 U	0.429	0.142
Total PAHs	0.0134 U	0.0134 U	0.0134 U	0.0134 U	0.2908	0.7806	0.0338	0.0134 U	0.0134 U	1.7221	0.574

Note:

U = Not Detected at Reported Detection Limit.

F:\DATA\Lab\Perf of Parcel 3\1530 Term 1 Support\1530-00 Parcel 3\Construction Report\Residue Risk Section\Appendix Tables\Table F-13

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